DEPARTMENT OF THE ARMY
HEADQUARTERS, 88TH REGIONAL SUPPORT COMMAND
60 SOUTH O STREET
FORT MCCOY, WISCONSIN 54656

REPLY TO
ATTENTION OF

May 11, 2012

Directorate of Public Works

RECEIVED
MAY 14 2012
SUPERFUND DIVISION

[redacted]

We wanted to take this opportunity to thank you for your assistance in allowing us to collect samples at your home and update you on our ongoing investigation into potential contamination for the former Hanley Area of the St. Louis Ordnance Plant. It is our intent to keep you informed as we continue our work to determine the extent of any environmental impacts related to that facility.

As you know, in February 2012, a contractor for the 88th Regional Support Command (RSC) collected environmental samples at your residence. We are enclosing a report summarizing the sampling effort for your information.

The sampling was completed to assess whether contamination is affecting local residents' indoor air quality through a process called vapor intrusion. Vapor intrusion occurs when vapors from volatile chemicals in groundwater or subsurface soil move through the soil and enter nearby buildings.

Samples of indoor and outdoor air, along with soil vapors from beneath the basement floor slab were collected from your residence to assess whether vapor intrusion may be of concern. Samples were analyzed for chemicals known as volatile organic compounds (VOCs). Those are the contaminants from the former Hanley Area that could potentially result in vapor intrusion.

As noted in the report, the indoor air sample could not be analyzed because of a technical problem at the laboratory. However, subslab soil gas samples and outdoor air samples were analyzed for chemicals known as volatile organic compounds (VOCs). Those are the contaminants from the former Hanley Area that could potentially result in vapor intrusion.

VOC concentrations detected in the samples were compared to levels developed using U.S. Environmental Protection Agency (EPA) methods. EPA has determined that these levels are protective of individuals who may be exposed to these chemicals through inhalation. Screening levels are very conservative and are usually several times lower than the final permissible levels.

The following Attachments are available only on CD

Attachment 1

OTYY

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Superfund

3.0

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As noted in the enclosed report, no VOC concentrations exceeded screening levels in the subslab soil gas samples. This suggests that the vapor intrusion pathway is not of concern at the residence, because VOCs do not appear to be accumulating beneath the basement floor slab at levels that pose concerns for indoor air quality.

Although the February 2012 results indicate that vapor intrusion is not a concern at the residence, the 88th RSC would like to collect another round of indoor air, outdoor air, and subslab soil gas samples to further assess the vapor intrusion pathway and determine whether subslab soil gas concentrations are changing over time. If you grant us permission to perform the follow-on work, we will provide a report on the sampling results in for your review.

The Army will also keep you informed of the vapor intrusion investigation being conducted at the former Hanley Area and along Stratford Avenue. Results from that investigation, along with the sampling the Army wishes to perform in your residence, will help the Army determine if there is a link between the former Hanley Area and chemical concentrations at the residence, should future sampling find VOC concentrations exceeding screening levels in indoor air or subslab soil gas. If a connection is found, the Army will take appropriate corrective measures to address the vapor intrusion pathway, at no cost to you.

We appreciate your cooperation and patience through the sampling process. We will contact you by phone in the coming days to ask for your permission to perform the follow-on work and answer questions you may have about that work or the information provided in the enclosed report. In the meantime, if you have any questions, please feel free to call contact Ms. Josephine Newton-Lund at (816) 389-3912, or by email at Josephine.M.Newton-lund@usace.army.mil or Mr. Barry McFarland at (316) 681-1759, extension 1419, or or by email at barry.mcfarland@usar.army.mil.

Sincerely,

David L. Moore
Chief, Public Works- Environmental Division

STATEMENT OF TECHNICAL REVIEW

Performance Work Statement for
Environmental Remediation Services at the Former Hanley Area
St. Louis Ordnance Plant, Missouri

February 2012 Vapor Intrusion Assessment at Private Property 3, St. Louis, Missouri

The Conti/CH2M HILL Team has completed the technical review of the submittal of the final report described above. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results including whether the product meets the customer's needs consistent with the law and existing USACE policy.

Technical Reviewer	Signature	Date of Review
Susanne Borchert	S. Borchert	May 9, 2012

Quality Control System Manager (for QCP) or Project Manager	ITR Leader
Luis Seijido	Susanne Borchert
Signature	Signature
	S. Borchert

February 2012 Vapor Intrusion Assessment at Private Property 3, St. Louis, Missouri

PREPARED FOR: U.S. Army Corps of Engineers–Kansas City District

PREPARED BY: CH2M HILL

DATE: May 10, 2012

This memorandum presents the objectives, methods, and findings of a vapor intrusion (VI) assessment performed at Private Property 3 (PP-3) in St. Louis from February 14 through 16, 2012. The assessment consisted of subslab soil gas, indoor air, and ambient (outdoor) air sampling in accordance with the following work plans:

- *Vapor Intrusion Assessment Work Plan Addendum—Revision 1, Former Hanley Area, St. Louis Ordnance Plant, St. Louis Missouri* (CH2M HILL 2011a)
- *Final Remedial Investigation* [RI] *Work Plan, Former Hanley Area, St. Louis Ordnance Plant, St. Louis Missouri* (CH2M HILL 2008a)
- *January 2012 Work Plan Attachment, Vapor Intrusion Assessment at Private Property 3* (CH2M HILL 2012)

The work described in this memorandum was the first round of VI assessment performed at PP-3.

The work was performed as part of the Defense Environmental Restoration Program under Contract Number W912DQ-05-D-0002, Task Order Number 0007.

1. Introduction

In consultation with the Missouri Department of Natural Resources (MDNR) and U.S. Environmental Protection Agency (USEPA), and with input from the public, the U.S. Army selected a preferred alternative for addressing contamination at the St. Louis Ordnance Plant, former Hanley Area. The preferred alternative was presented in the proposed plan (CH2M HILL 2010a) submitted for public comment in November 2010.

During development of the decision document, the project stakeholders agreed to divide the former Hanley Area into two operable units (OUs):

- OU-1: Actions Addressing Contaminated Soil, Powder Well Sediment, and Groundwater Concerns
- OU-2: Actions Addressing the VI Pathway

In September 2011, a decision document for OU-1 was finalized, signed by the Army Environmental Command, and endorsed by MDNR and USEPA (CH2M HILL 2011b). Remedial actions to address OU-1 are under way. These actions consist of onsite groundwater treatment and offsite disposal of excavated soil and powder well sediment.

As part of OU-2 and to assess the VI pathway, the Army is collecting groundwater, subslab soil gas, indoor air, and outdoor air samples from select residential properties north of the former Hanley Area (Figure 1). The properties were selected based on VOC concentrations in groundwater, the residence's proximity to the former Hanley Area, and previous VI investigation findings at adjacent properties. The samples will help assess potential migration of contaminated vapors from groundwater to indoor air. The OU-2 sampling effort was triggered by concentrations of volatile organic compounds (VOCs) measured in groundwater following the RI performed in 2008. Groundwater concentrations of VOCs were characterized during the RI and a post-RI sampling event in August 2010. Figure 2 shows the VOC concentrations in groundwater that exceeded VI risk-based screening levels at all sampling locations. In the vicinity of PP-3 the groundwater generally flows to the northeast.

2. Objective

The objective of the VI assessment was to obtain information to determine if contamination from the former Hanley Area may be contributing to VI at PP-3.

3. Description of Residence

[redacted]

4. Methods

4.1 Pre-investigation Site Visit

CH2M HILL conducted a site visit to collect information for the VI assessment on January 25, 2012. During the site visit, the homeowner stated that the floor in the laundry room was removed and reinstalled in 2007 to replace a clay sanitary sewer pipe with polyvinyl chloride pipe. The homeowner noted that several utilities ran beneath the floor in the laundry room.

No evidence of groundwater seepage into the basement was observed during the site visit. However, the homeowner noted that the laundry room floods once or twice a year because the floor drain backs up during heavy rain events. A sump was not observed in the basement. A building inspection form was completed and is included as Attachment 1.

4.2 Subslab Soil Gas Sampling

On February 14, 2012, CH2M HILL installed a subslab soil gas probe at one location through the basement floor at PP-3. Subslab soil gas sample location SG-01 was positioned in the southeastern unfinished area through an existing hole in the floor (Figure 3). Before the subslab sample probe was installed, utility markouts were inspected to verify that the proposed sample location was clear of utilities. Water, gas, electric, and telephone/ cable utilities did not interfere with the sample location at PP-3.

Subslab soil gas sample probe SG-01 was installed in an existing hole (1 inch in diameter) about 6 feet east of the west exterior wall and 6 feet north of the south exterior wall. Another existing 1 inch diameter hole in the basement floor was plugged with Cement-All at the time that sample probe SG-01 was installed. The hole in the concrete slab appeared to extend through the entire thickness of the slab. This was verified during installation of the subslab sample probe. A hammer drill equipped with a 1-inch drill bit was used to ream the hole and to extend the depth of the hole to accommodate the 1¼-inch sampling union. The thickness of the concrete slab was observed to be ¾ inch thick. Cuttings were removed with a shop vac. Moist, native brown lean clay with coarse material was observed below the slab. The drill was then equipped with a 5/16-inch drill bit and a hole was advanced 4¼ inches into the soil. The hole was advanced into the soil to allow a sufficient void to accommodate the sampling probe and to allow potential subslab soil gas to accumulate in the void below the sampling probe.

A ¼-inch stainless steel sample probe was installed on the sampling union to a total length of 3 inches. Teflon tape was wrapped around the probe to prevent mortar fouling of the bottom of the probe. The sample probe was then placed into the hole, which extended 2¼ inches into the bedding material. The mortar, Cement-All, was prepared using distilled water and emplaced around the sampling union at SG-01 to create a leak-free seal.

The floor in the utility room at PP-3 was inspected and no cracks were observed. The heating system was operating during installation of the subslab soil gas probe.

On February 15, 2012, the subslab soil gas sample probe location installed in the unfinished portion of the basement was purged and 6-liter SUMMA canisters deployed for 24-hour sample collection. Prior to purging of the subslab

sample probe, the integrity of the seal was visually inspected for signs of cracks and shrinkage. No visual defects in the seals were noted. Additionally, distilled water was poured into the drain located in the laundry room to fill the trap. The sink in the laundry room was also allowed to run to allow water to fill the trap. Chemicals observed in the HVAC room where the subslab soil gas sample probe was installed were removed and placed in the laundry room. A total VOC reading was collected at the floor drain in the laundry room using a calibrated MultiRAE, as well as an indoor air total VOC reading in the HVAC room. Total VOC readings were 0 parts per million (ppm) for the floor drain and the HVAC room. CH2M HILL conducted a leak check of the subslab soil gas probes before sampling. Leak check procedures were performed in accordance with the SOP provided in the work plan addendum. The leak check was performed using 100 percent helium gas as a tracer to determine whether indoor air was infiltrating into the subslab sample probe during purging. Helium was released into an enclosure over the soil gas probe. At least 2 liters of subslab soil gas were purged into a 3-liter Tedlar bag during the leak check. Once the bag was filled, a helium leak detector was used to sample the bag for helium. No helium was detected within the purged subslab soil gas, demonstrating that the soil gas probe passed the helium leak test.

Following the successful leak check, two 6-liter, individually certified SUMMA canisters (one normal sample and one field duplicate) were used to collect the subslab soil gas samples. The canisters were opened on February 15, 2012, and remained open for roughly 24 hours. A flow controller set for 3.75 milliliters per minute allowed the SUMMA canisters to fill over a period of 24 hours.

On February 16, 2012, CH2M HILL returned to the residence and closed the sample port on the subslab soil gas SUMMA canisters. CH2M HILL arrived at the residence within 24 hours of opening the canister to ensure that it had not reached atmospheric pressure before closing the valve. Final vacuum was measured at -8 inches of mercury in the subslab soil gas canister (SG-01) and -6 inches in the field duplicate canister (SG-01) using a standard vacuum gauge. Attachment 2 contains photographs of the sampling setup and canister placements.

4.3 Indoor Air and Outdoor Air Sampling

On February 15, 2012, CH2M HILL deployed sample canisters for indoor air and outdoor air sampling. CH2M HILL placed and opened a 6-liter, individually certified SUMMA canister in the basement of the residence to collect an indoor air sample. The indoor air canister was located on top of small end table about 5 feet north of the south exterior wall and 12 feet east of the west exterior wall, away from any observed chemicals. To collect an outdoor air sample, CH2M HILL deployed a 6-liter, individually certified SUMMA canister outside the residence, near the side door on the east side of the residence. Teflon tubing was installed on the canister and the end of the tubing was placed in a downward position to prevent rain from entering the canister. No chemicals were observed in the area. The canisters were kept open for 24 hours using a flow controller set for 3.75 milliliters per minute, which allowed the canisters to fill over a 24-hour period.

On February 16, 2012, CH2M HILL returned to the residence and closed the sample ports on the indoor air and outdoor air SUMMA canisters. CH2M HILL arrived at the residence within 24 hours of opening the canisters to ensure that they had not reached atmospheric pressure before closing the valves. The final vacuum was measured at -4 inches of mercury using a standard vacuum gauge in the indoor air canister, and -6 inches of mercury in the outdoor canister. Attachment 2 contains photographs of the sampling setup and canister placements.

4.4 Laboratory Analyses

Subslab soil gas, indoor air and outdoor air samples were analyzed for VOCs by method TO-15 Selective Ion Mode. The VOC reporting list comprised the compounds:

- Benzene
- Carbon tetrachloride
- Chloroform
- Naphthalene
- Methylene chloride
- 1,2-Dichloroethane (1,2-DCA)
- *cis*-1,2-Dichloroethene (*cis*-1,2-DCE)
- *trans*-1,2-Dichloroethene (trans-1,2-DCE)
- Vinyl chloride
- 1,1,2,2-tetrachloroethane (1,1,2,2-TeCA)
- 1,1,2-trichloroethane (1,1,2-TCA)
- Tetrachloroethene (PCE)
- Trichloroethene (TCE)

Subslab soil gas samples were analyzed by method TO-15 Selective Ion Mode. The air canisters were shipped to Applied Science Laboratories in Corvallis, Oregon, for analysis.

Once the laboratory received the canisters, the vacuum in each canister was measured before analysis (Table 1). As shown in Table 1, differing canister vacuums were measured in the field after sampling and at the laboratory before analysis. The laboratory measurements are considered more representative, because the pressure gauges used in the field during sampling did not completely "zero out" at atmospheric pressure, indicating that the field gauge readings were biased slightly low. The difference between the field and laboratory measurements is comparable for each canister, further indicating that the discrepancy is associated with field gauge accuracy. Sample leakage during transit does not appear to have occurred because the laboratory reported higher vacuums than the field measurements. Sufficient sample volume was present in each canister for the VOC analysis, and the canisters did not reach atmospheric pressure (indicating loss of sample) during the sampling period.

The laboratory reported that the indoor air sample (IA-01) could not be analyzed because of contamination during the laboratory screening process. The calibration standard was left open while low level samples were being screened on the same instrument. This caused contamination of IA-01 as the autosampler's rotary valve changed positions. This was an error because standard laboratory practice is to not have calibration standards and/or high level scan samples on the autosampler at the same time as low level samples.

5. Findings

5.1 Chemical Inventory

A chemical inventory was conducted during the February 2012 VI assessment to record the amounts and types of chemicals stored within the residence. This information was collected to identify possible indoor sources of VOCs. Table 2 summarizes the chemicals observed during the chemical inventory performed during the February 2012 sampling event. Attachment 1 contains the inspection forms that were completed during the pre-investigation site visit.

The type of chemicals observed in February 2012 in the basement at PP-3 had not changed since the January 25, 2012, pre-investigation site visit. The chemicals observed in the unfinished HVAC room in January 2012 were removed and placed in the laundry room in the opposite corner of the basement before the February 2012 sampling event.

The heating system was operating during deployment of the subslab soil gas probes and indoor air canisters at PP-3.

5.2 Other Field Observations

The weather was cloudy with a steady light to moderate rain on February 15 when the canisters were deployed and cloudy and dry on February 16 when the canisters were picked up.

5.3 Analytical Results

Table 3 presents the indoor air, outdoor air, and subslab soil gas concentrations measured at PP-3. In accordance with the work plan addendum, concentrations were compared against the most conservative screening levels from the following sources of information:

- Subslab Soil Gas Screening Levels
  - USEPA (November 2011) Regional Screening Levels for Residential Air were adjusted using the USEPA (2002 and 2008) default subslab soil-gas-to-indoor air attenuation factor of 0.1.
  - Tier 1 risk-based target levels (Soil Vapor—Indoor Inhalation of Vapor Emissions) for residential land use and soil type 3 (clayey) presented in the Missouri Risk-based Corrective Action (MRBCA) technical guidance (MDNR 2006). Observations from the 2008 VI assessment indicate that clay is the predominant soil type in the properties north of the former Hanley Area.
  - A USEPA Regional Screening Level does not exist for *cis*-1,2-DCE. For this reason, *trans*-1,2-DCE was used as a surrogate for this chemical.

- Indoor and Outdoor Air Screening Levels
  - USEPA (November 2011) Regional Screening Levels for Residential Air.
  - Tier 1 risk-based target levels (indoor air) for residential land use presented in the MRBCA technical guidance (MDNR 2006).

As noted, the laboratory reported that the indoor air sample (IA-01) could not be analyzed due to contamination in the laboratory during the sample screening process. This presents a data gap in that indoor and outdoor air concentrations could not be compared and evaluated. The attached Data Quality Evaluation Report (Attachment 3) contains an assessment of data quality for the samples analyzed.

5.4 Screening Approach

Table 3 summarizes laboratory analytical results from the outdoor air and subslab soil gas samples. No chemical concentrations in subslab soil gas exceeded screening levels described in Section 5.3. This result suggests that chemical concentrations in the subslab are not present in concentrations high enough to pose a VI concern.

6. Recommended Next Steps

In February 2012, indoor air, outdoor air, and subslab soil gas samples were collected from PP-3. The indoor air sample could not be analyzed because of contamination in the laboratory during the laboratory screening process. Although the indoor air sample could not be analyzed, the subslab soil gas sampling results indicate that the VI pathway is not of concern. This is because all chemicals measured in the subslab soil gas sample fell below screening levels.

Although the results suggest that VI may not be of concern, another round of sampling is recommended to assess changes in subslab soil gas concentrations over time and to compare indoor air concentrations with those present in outdoor air and subslab soil gas. This information will provide additional insight into whether the VI pathway is potentially affecting indoor air quality.

The Army will seek approval from the resident to perform the additional sampling.

7. References

CH2M HILL. 2008a. *Final Remedial Investigation Work Plan, Former Hanley Area, St. Louis Ordnance Plant, St. Louis Missouri.* May.

CH2M HILL. 2008b. *Final Work Plan Vapor Intrusion Assessment, Former Hanley Area, St. Louis Ordnance Plant, St. Louis Missouri.* March.

CH2M HILL. 2009. *Final Remedial Investigation Report, St. Louis Ordnance Plant, Former Hanley Area, St. Louis, Missouri.* November.

CH2M HILL. 2010a. *Proposed Plan, St. Louis Ordnance Plant, Former Hanley Area, St. Louis, Missouri*. December.

CH2M HILL. 2010b. *Final Feasibility Study Report, St. Louis Ordnance Plant, Former Hanley Area, St. Louis, Missouri.* July.

CH2M HILL. 2011a. *Vapor Intrusion Assessment Work Plan Addendum—Revision 1, St. Louis Ordnance Plant, Former Hanley Area, St. Louis, Missouri.* December.

CH2M HILL. 2011b. *Final Decision Document, St. Louis Ordnance Plant, Former Hanley Area, St. Louis, Missouri.* July.

Department of Defense. 2009. *Department of Defense Vapor Intrusion Handbook*. January.

Interstate Technology & Regulatory Council. 2007. *Vapor Intrusion Pathway: A Practical Guideline.* http://www.itrcweb.org/guidancedocument.asp?tid=49.

Missouri Department of Natural Resources (MDNR). 2006. *Missouri Risk-Based Corrective Action (MRBCA) Technical Guidance.* April.

U.S. Environmental Protection Agency. 2002. *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance).* EPA530-D-02-004.

U.S. Environmental Protection Agency. 2008. *U.S. EPA's Vapor Intrusion Database: Preliminary Evaluation of Attenuation Factors*. Office of Solid Waste, U.S. Environmental Protection Agency, Washington DC. March 4. http://iavi.rti.org/index.cfm.

U.S. Environmental Protection Agency. 2011. Regional Screening Levels. June. http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm.

U.S. Environmental Protection Agency (USEPA). 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). EPA530-D-02-004.

Tables

TABLE 1

Indoor Air, Outdoor Air, and Subslab Soil Gas Sampling Details

Vapor Intrusion Assessment, Private Property PP-3, St. Louis, Missouri

Sample Location	Canister ID	Purge Start Date and Time	Purge End Date and Time	Sampling Start Date and Time	Sampling End Date and Time	Medium Sampled	Initial Canister Vacuum (inches Hg)	Purge Vacuum (inches Hg)	Final Canister Vacuum Measured in Field After Sampling (in. Hg)	Final Canister Vacuum Measured at Laboratory (in. Hg)
PP03-AA-01	6L2470A	not applicable	not applicable	2/15/2012 15:20	2/16/2012 12:49	Ambient Air	-30	0	-6	-4.6
PP03-IA-01	6L2569A	not applicable	not applicable	2/15/2012 15:00	2/16/2012 12:50	Indoor Air	-30	0	-4	-3.6
PP03-SG-01	6L2557A	2/15/2012 14:45	2/15/2012 14:55	2/15/2012 15:11	2/16/2012 12:51	Soil Gas	-27	not applicable	-8	-7.1
PP03-SG-01FD	6L2644A	2/15/2012 14:45	2/15/2012 14:55	2/15/2012 15:12	2/16/2012 13:32	Soil Gas	-27	not applicable	-6	-5.4

Note: Analytical method was TO-15 Selective Ion Mode.

inches Hg - inches of mercury

TABLE 2

Chemical Inventory

Vapor Intrusion Assessment, Private Property PP-3, St. Louis, Missouri

Household Name	Location
Foaming Body Cleanser	placed in laundry room
Simple Green all purpose cleaner	placed in laundry room
Purell	placed in laundry room
CRC spray adhesive	placed in laundry room
Behr stucco and brick paint	placed in laundry room
Behr floor and porch paint	placed in laundry room

TABLE 3

Summary of Chemicals Detected in Outdoor Air and Subslab Soil Gas Samples - February 2012

Vapor Intrusion Assessment, Private Property PP-03, St. Louis, Missouri

	Location>>	PP03-AA-01		PP03-SG-01	PP03-SG-01 FD
	Sample Date>>	2/16/2012		2/16/2012	2/16/2012
	Analytical Method>>	TO-15 SIM		TO-15 SIM	TO-15 SIM
Analyte	Indoor/Outdoor Air Screening Level[1]	Outdoor Air	Subslab Soil Gas Screening Level[1]	Soil Gas	Soil Gas
1,1,2,2-Tetrachloroethane	0.042	0.023 U	0.42	0.024 U	**0.079 J**
1,1,2-Trichloroethane	0.15	**0.091 J**	1.5	0.019 U	**0.030 J**
1,2-Dichloroethane (1,2-DCA)	0.094	**0.077 J**	0.94	**0.015 J**	0.014 U
Benzene	0.31	**0.88**	3.1	**0.18**	**0.19**
Carbon tetrachloride	0.41	**0.53**	4.1	**0.072 J**	**0.073 J**
Chloroform	0.11	**0.11 J**	1.1	**1.0**	**1.0**
cis-1,2-Dichloroethene	63[2]	0.033 U	630[2]	**0.059 J**	0.033 U
Methylene chloride	5.2	**0.33 J**	52	0.0082 U	**0.068 J**
Naphthalene	0.072	**0.13 J**	0.72	**0.16 J**	**0.19**
Tetrachloroethene (PCE)	9.4[3]	**0.13 J**	94[3]	**2.3**	**2.2**
trans-1,2-Dichloroethene	63	0.13 U	630	**0.036 J**	0.013 U
Trichloroethene (TCE)	0.43	0.064 U	4.3	**0.41**	**0.40**
Vinyl Chloride	0.16	0.0085 U	1.6	0.0089 U	0.0085 U

Note:: all unites in micrograms per cubic meter

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U - Analyte was not detected above the method detection limit.

Bold indicates the analyte was detected above the method detection limit.

Bold and shading indicates the result was detected and exceeded screening criteria.

Bold and italicized values represent nondetected chemicals with a method detection limit that exceeded the screening level.

[1] U.S. Environmental Protection Agency (USEPA) Residential Screening Level (RSL) for Resident Air, unless otherwise noted. Subslab soil gas screening levels adjusted using the USEPA (2002 and 2008) default subslab soil-gas-to-indoor air attenuation factor of 0.1.

[2] A USEPA RSL does not exist for cis-1,2-dichloroethene. For this reason, trans-1,2-dichloroethene was used as a surrogate for this chemical.

[3] Based on final toxicity information posted on the USEPA Integrated Risk Information System (IRIS), February 10, 2012

Figures

N

0 30 60 Feet

LEGEND

Site Boundary

Former Building

Monitoring Well

FIGURE 1
LOCATION OF VAPOR INTRUSION ASSESSMENT
St. Louis Ordnance Plant
Former Hanley Area
St. Louis, Missouri

CH2MHILL

RDD \\BALDUR\PROJ\SLOP_349765\MAPFILES\VI_AWP_R1\FIG1_VI_ASSESS_LOC_PP-3_VIAWP1.MXD MSCHROCK 2/1/2012 11:00 51 PM

Attachment 1
Building Inspection Forms

Building Survey - Indoor Air Sampling

Project Information			*Page 1 of 3*
Project Name:	**St. Louis Ordnance Plant**	Project # :	**364298**
Survey Completed By:	**T. Swierczek**	Date:	**01/25/12**
Building Address:	**Private Property 3**	Residence ID:	**PP-3**

[redacted]

Building Address: **PP-3** Date: **1/25/2012**

[redacted]

Building Address: **PP-3** Date: **1/25/2012**

Miscellaneous Information Continued:

Have there been any known spills of a chemical immediately outside or inside the building? **No**

Describe (with location):

Do any of the occupants smoke inside the building? **No** How often?

Do any of the occupants use solvents at work? **No** Are their clothes washed at home? **Yes**

If so, when - and what rooms? **Clothes are regularly washed. Washer and dryer are located in the basement.**

Within the last 6 months, has there been any painting or remodeling in the residence? **No** If so, when

What rooms, and what specifically was done?

Within the last 6 months, has any new carpeting been installed? **No** Have the carpets or rugs been cleaned? **No**

If so, when, what rooms, and what cleaners?

Consumer Products Inventory

Check consumer products that are present in the residence.

		Storage Location	Frequency of Usage	Date of Last Use
☐	Paint or Wood Finishes (spray or can)			
☐	Paint stripper / remover / thinner			
☐	Solvent cleaners (eg. spray-on oven cleaner)			
☐	Metal degreaser / cleaner			
☐	Gasoline / diesel fuel			
☐	Glues or adhesives (super glue, etc)			
☐	Air fresheners & scented candles			
☐	Laundry / carpet spot removers			
☐	Pesticides / Insecticides			
☐	Nail polish remover (acetone)			
☐	Aerosols (deodorizers, polish, cleaners)			
X	Other: **See chemical inventory below**			
☐	Other:			
☐	Other:			

Describe any products that are containerized during sampling event:

Items observed in basement laundry room during inspection: Magic starch; Niagra heavy starch; Ultra Tide detergent; Clorox bleach; Supersonic high solids solvent-based spray buff; Head & Shoulders shampoo; White Rain conditioner; softner sheets

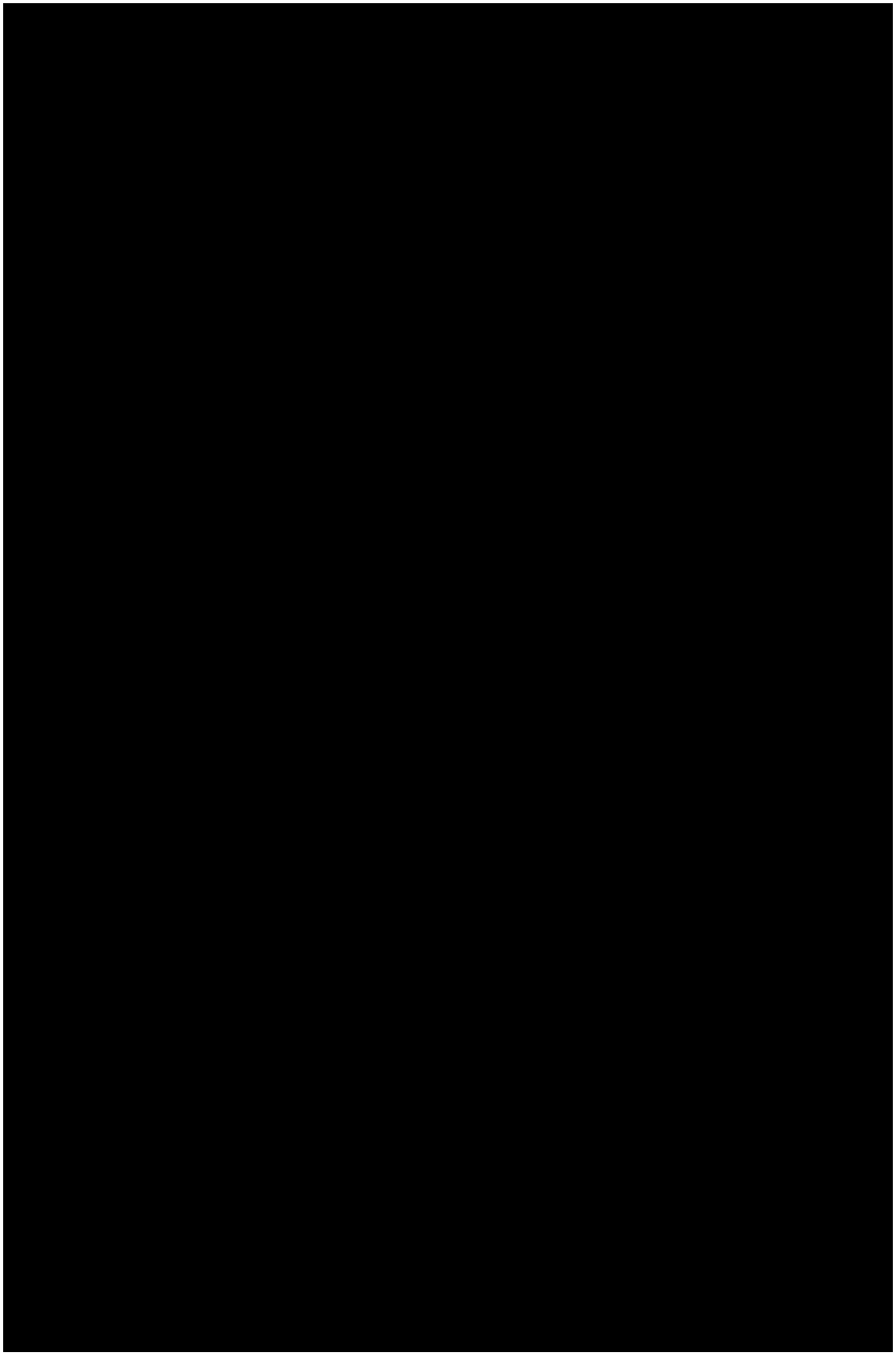
Items observed in basement HVAC room during inspection: foaming body cleanser; KY liquid; Simple Green all-purpose cleaner; Purell; CRC spray adhesive; Behr stucoo and brick paint; Behr floor and porch paint

Items observed in basement computer room during inspection: Studio 35 non-acetone and regular nail polish remover; foot cream; Design Master glitter gold spray; Purell; Office Depot shredder lubricant

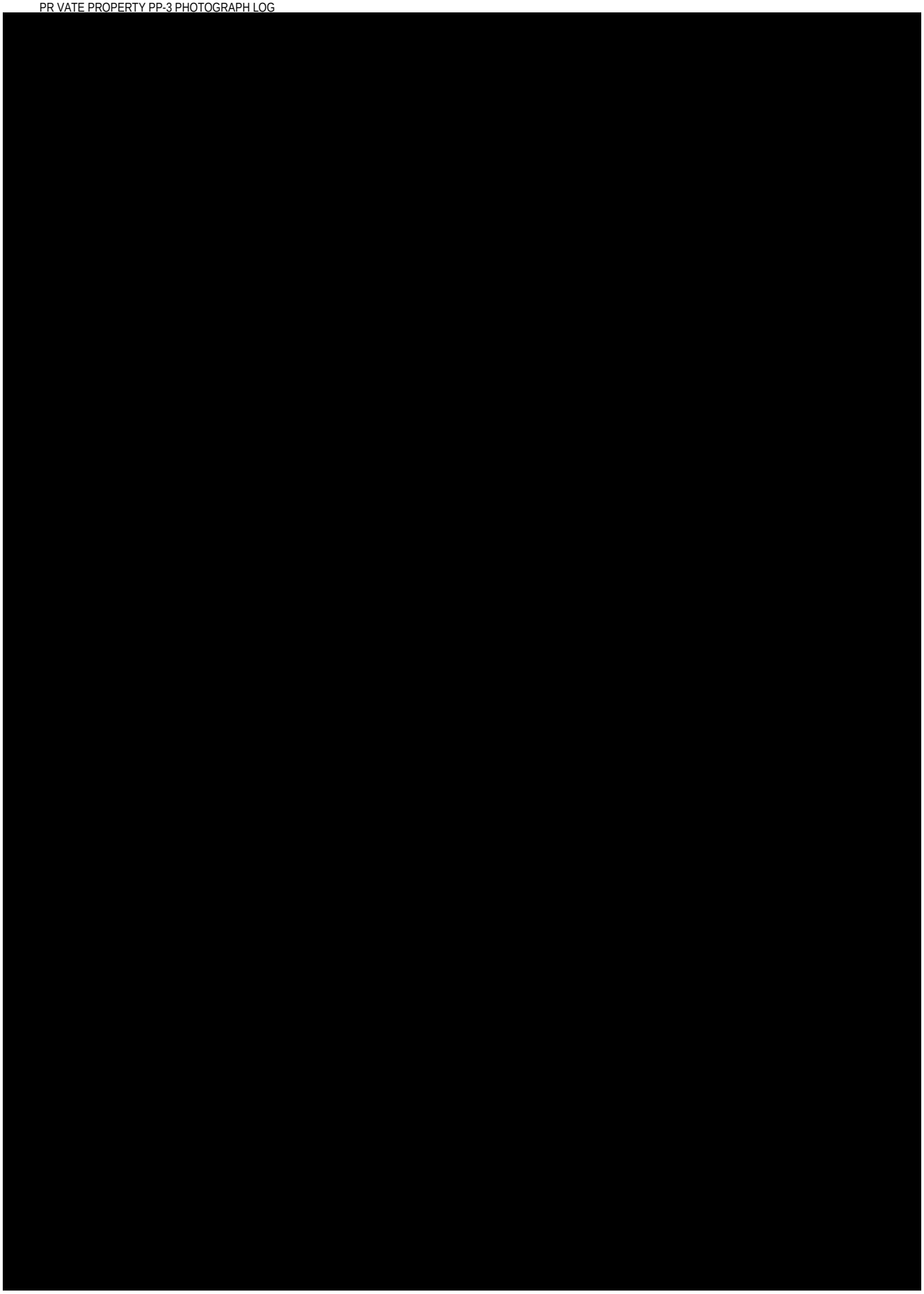
[redacted]

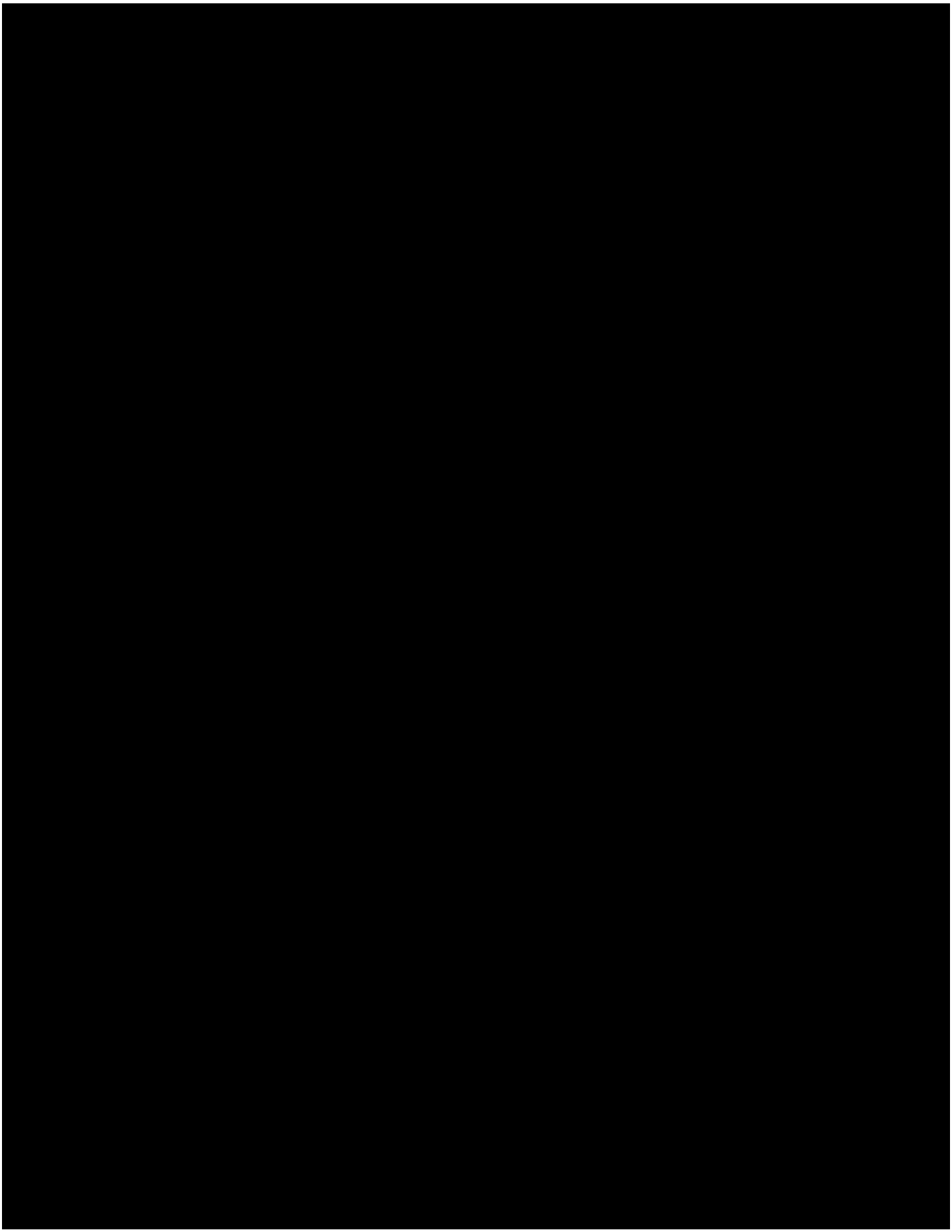
Attachment 2
Photographs

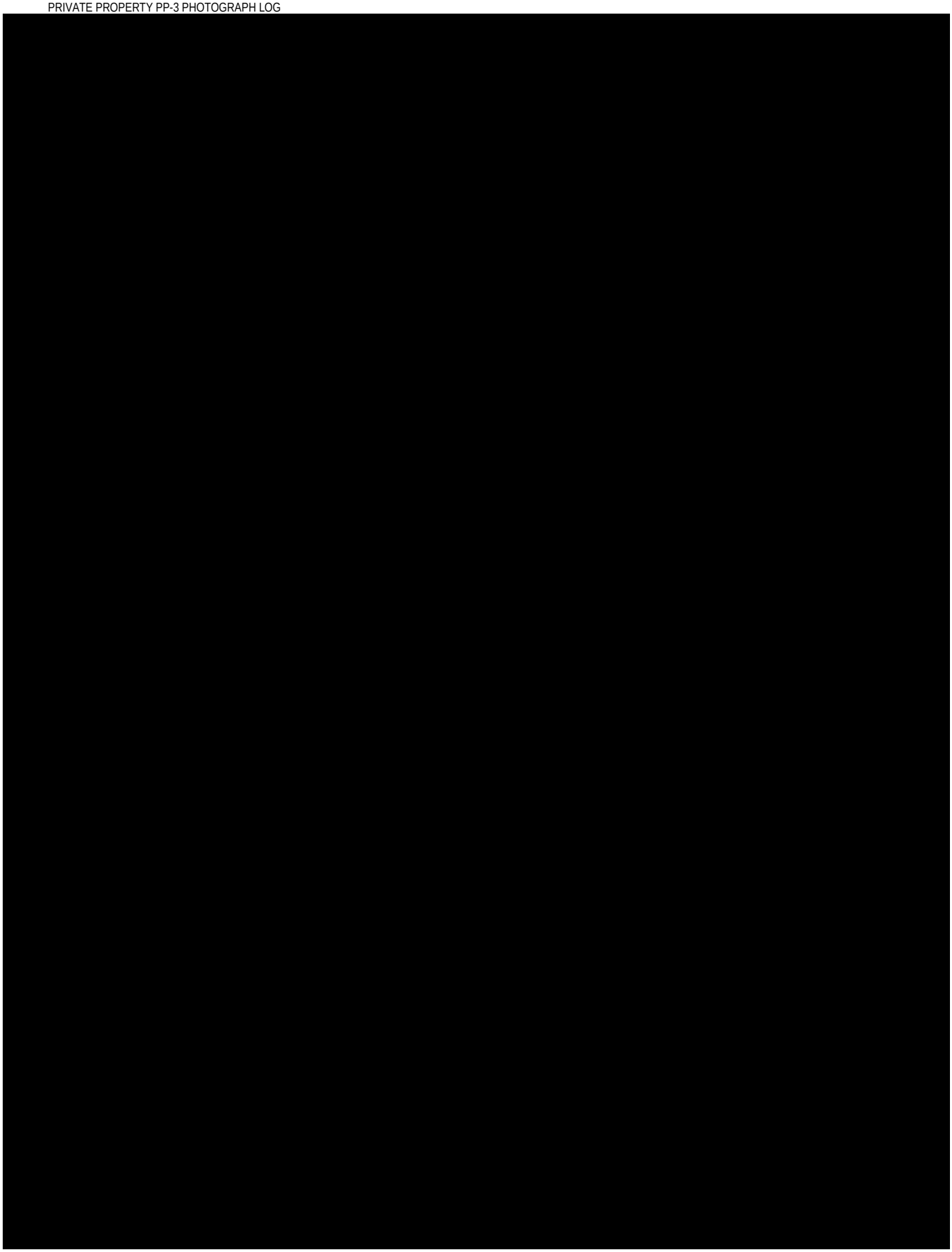
Private Property PP-3 Photograph Log



PR VATE PROPERTY PP-3 PHOTOGRAPH LOG







Attachment 3
Data Quality Evaluation

Vapor Intrusion Assessment for Private Property 3

Data Quality Evaluation Report
St. Louis Ordnance Plant
Former Hanley Area
St. Louis, Missouri

Submitted to

U.S. Army Corps of Engineers
Kansas City District

April 2012

CH2MHILL

Contents

Tables

Attachment

Acronyms and Abbreviations

DQE	data quality evaluation
FD	field duplicate
LCS	laboratory control sample
N	normal
PARCC	precision, accuracy, representativeness, completeness, and comparability
QAPP	quality assurance project plan
QC	quality control
RPD	relative percent difference
SDG	sample delivery group

Data Quality Evaluation Report

Introduction

The objective of this data quality evaluation (DQE) report is to assess the quality of analytical results for ambient (outdoor) air and subslab soil gas samples collected on February 15 2012, during the vapor intrusion assessment for PP-3 at the St. Louis Ordnance Plant, former Hanley Area, located in St. Louis, Missouri. Individual method requirements and guidelines from the *Final Quality Assurance Project Plan, Former Hanley Area, St. Louis, Missouri* (QAPP) (CH2M HILL 2007), were used as the basis for this assessment.

Analytical Approach

The sampling and analysis objective of the former Hanley Area Vapor Intrusion Assessment for PP-3 was to determine the presence or absence of volatile organic compounds contamination in air at the site.

Analytical Data

This DQE covers one ambient air normal (N) sample, one soil gas N sample and one soil gas field duplicate (FD). The data were reported in one sample delivery group (SDG) listed L1206. The list of samples and collection dates is provided in Table 1. The air samples were delivered to CH2M HILL's Applied Sciences Laboratory in Corvallis, Oregon, and analyzed by Method TO-15 SIM.

One hundred percent of the data were reviewed and verified in accordance with the QAPP. The review included the following items:

- A review of the SDG narrative to identify issues that the laboratory reported in the data deliverable
- A check of sample integrity (chain of custody, preservation, and holding times)
- An evaluation of basic quality control (QC) measurements used to assess the accuracy, precision, and representativeness of data including QC blanks, laboratory control samples (LCS), surrogate recoveries, and field or laboratory duplicate results
- An evaluation of calibration and QC summary results against the project requirements
- A review of sample results, target compound lists, and detection limits to verify that project analytical requirements were met
- A review to verify that corrective actions were initiated, as necessary, based on the data review findings
- A qualification of the data using appropriate qualifier flags, as necessary, to reflect data usability limitations

- Other method-specific QC requirements

Data flags were assigned according to the QAPP. The flags and the reason for each flag were entered into the electronic database. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will be only one final flag. The data reported will be qualified by a single flag that reflects the most conservative of the applied validation qualifiers. The final flag also includes matrix and blank sample impacts.

The data flags are defined as follows:

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- R = The sample result was rejected because of serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
- U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Findings

The findings of the data review and verification are summarized in the following sections. As previously discussed, the flags in the final data tables reflect the most severe verification qualifier. Verification Findings are listed in Table 2, and the verification reason codes are defined in Table 3.

The laboratory reports can be found in Attachment 1.

Field Sample Completeness

N samples were collected and analyzed as required.

Holding Times

All holding-time criteria were met.

Calibration

All initial and continuing calibration requirements were met.

Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination that would have affected the reported sample results.

Field Duplicates

A FD was collected at the required frequency of one FD for every 10 N samples collected per matrix. A comparison of N sample counts and FD sample counts is presented in Table 4.

A list of the FD and associated parent sample is presented in Table 5.

The relative percent differences (RPD) between the N and FD sample met acceptance criteria.

Surrogates

Surrogates were used according to method requirements and all acceptance criteria were met.

Laboratory Control Samples

An LCS was analyzed as required and all acceptance criteria were met.

Internal Standards

Internal standard recovery criteria were met for all samples.

Canister/Flow Controller Certifications

The air and soil gas samples were collected in SUMMA canisters, which were certified clean per project instructions prior to shipment to the project site. The laboratory was not able to certify all canisters and flow controllers clean to the method detection limit for all target analytes. Low-level detections in the samples are possibly due to contamination in the canisters/flow controllers. The canisters/flow controllers were free of contamination with the following exceptions:

Several analytes were detected in the canisters and/or flow controllers at concentrations less than the reporting limit. Data were qualified as not detected and flagged “U” when the sample concentrations were less than five times (10 times for common laboratory contaminants) the concentrations detected in the canisters and/or flow controllers.

Chain of Custody

Each sample was documented in a completed chain of custody and received at the laboratory in good condition.

Overall Assessment

The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the resulting analytical data can be used to support the decision making process. The procedures for assessing the precision, accuracy, representativeness, completeness, and comparability parameters (PARCC) were based on the approved QAPP. The following summary highlights the PARCC findings for the above-defined events:

- Precision of the data was verified through the review of the field data quality indicators that include: FD and LCS/LCSD RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of the calibration data, LCS/LCSD, internal standards, and surrogate standard recoveries, as well as the evaluation of the method blank and canister/flow controller data. Accuracy was generally acceptable with the exception of trichloroethene and/or methylene chloride, which were qualified as not detected due to contamination in the flow controllers. Data users should consider the impact to any result that is qualified as it may contain a bias that could affect the decision making process.

- Representativeness of the data was verified through the sample's collection, storage, and the verification of holding-time compliance. The laboratory did not note any issues related to sample collection or storage of the samples. All data were reported from analyses within the USEPA-recommended holding time.
- Comparability of the data was verified through the use of standard USEPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal of 90 percent was met for all analyte/methods.

TABLE 1
Samples Associated with DQE
St. Louis Ordnance Plant Vapor Intrusion Assessment Report for PP-3, St. Louis, Missouri

Matrix	Sample ID	QA/QC Type	Sample Date	SDG
AIR	PP03-AA-01-021512	N	02/15/2012	L1206
AIR	PP03-SG-01-021512	N	02/15/2012	L1206
AIR	PP03-SG-01-021512-FD	FD	02/15/2012	L1206

TABLE 2
Verification Findings
St. Louis Ordnance Plant Vapor Intrusion Assessment Report for PP-3, St. Louis, Missouri

Matrix	Method	Analyte	Sample ID	Result	Units	Validation Reason	Final Validation Flag
Air	TO15 SIM	Trichloroethene (TCE)	PP03-AA-01-021512	0.0639	UG/M3	U	FC<RL
Air	TO15 SIM	Methylene chloride	PP03-SG-01-021512	0.0823	UG/M3	U	FC<RL

TABLE 3
Verification Reason Code Descriptions
St. Louis Ordnance Plant Vapor Intrusion Assessment Report for PP-3, St. Louis, Missouri

Verification Reason Code	Verification Reason Code Description
FC<RL	The analyte was detected in the flow controller at a concentration less than the reporting limit

TABLE 4
N and FD Sample Counts by Matrix and Method
St. Louis Ordnance Plant Vapor Intrusion Assessment Report for PP-3, St. Louis, Missouri

Matrix	Method	N Sample Count	FD Sample Count
Air	TO15 SIM	2	1

TABLE 5
List of Field Duplicates
St. Louis Ordnance Plant Vapor Intrusion Assessment Report for PP-3, St. Louis, Missouri

Matrix	FD Sample ID	Parent Sample ID
Air	PP03-SG-01-021512-FD	PP03-SG-01-021512

Attachment 1
Laboratory Data Packages

ANALYTICAL REPORT

For:
SLOP

ASL Report #: L1206

Project ID: 364298.01.SL.VI.VM

Attn: Chris English/STL

cc:
Shane Lowe/STL

Authorized and Released By:

Laboratory Project Manager
Ben Thompson
(541) 758-0235 ext.23132
March 05, 2012

This data package meets standards requested by client and is not intended or implied to meet any other standard.

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Sample Receipt Comments

We certify that the test results meet all standard ASL requirements.

Sample Cross-Reference

ASL Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
L120601	PP03-IA-01-021512	02/15/12 15:10	02/20/12 08:36
L120602	PP03-SG-01-021512	02/15/12 15:11	02/20/12 08:36
L120603	PP03-SG-01-021512-FD	02/15/12 15:12	02/20/12 08:36
L120604	PP03-AA-01-021512	02/15/12 15:20	02/20/12 08:36
L120605	PP02-IA-01-021612	02/16/12 11:56	02/20/12 08:36
L120606	PP02-IA-01-021612-FD	02/16/12 11:57	02/20/12 08:36
L120607	PP02-SG-01-021612	02/16/12 11:58	02/20/12 08:36
L120608	PP02-SG-02-021612	02/16/12 12:00	02/20/12 08:36
L120609	PP02-AA-01-021612	02/16/12 12:15	02/20/12 08:36

ASL Report #: L1206

Table of Contents

CH2MHILL
Applied Sciences Laboratory (ASL)

CH2M HILL
Applied Sciences Laboratory (ASL)
1000 NE Circle Blvd, Building 10
Suite 10350
Corvallis, OR 97330
Tel 541.768.3120
Fax 541.752.0276

Organic CLP and CLP-Like Data Qualifiers

U	The analyte was analyzed for, but not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
P	The primary and confirmation analyte result recoveries do not match.
E	The analyte was positively identified; the associated numerical value exceeded the instrument calibration range.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Inorganic CLP and CLP-Like Data Qualifiers

U	The analyte was analyzed for, but not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
E	The analyte was positively identified; the associated numerical value exceeded the instrument calibration range.
N	The matrix spike/matrix spike duplicate recovery for the analyte is outside of acceptance criteria—qualifier is applied to the native sample only.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

TO-15 SIM

CASE NARRATIVE
VOLATILE ORGANIC ANALYSIS

Analytical Method: TO-15 SIM AAB#: L1206

Lab Name: CH2M HILL Applied Science Laboratories Project # 364298.01.SL.VI.VM

Base/Command: SLOP Prime Contractor:

I. RECEIPT

A. Date: February 20, 2012

B. Sample Information:

LAB SAMPLE ID	CLIENT SAMPLE ID	CANISTER ID	SAMPLE MATRIX	DATE SAMPLED	TIME SAMPLED	RECEIVED PRESS. (torr)
L120601	PP03-IA-01-021512	6L2469A	AIR	02/15/2012	15:10	669
L120602	PP03-SG-01-021512	6L2557A	AIR	02/15/2012	15:11	581
L120603	PP03-SG-01-021512-FD	6L2644A	AIR	02/15/2012	15:12	622
L120604	PP03-AA-01-021512	6L2470A	AIR	02/15/2012	15:20	644
L120605	PP02-IA-01-021612	6L2712A	AIR	02/16/2012	11:56	577
L120606	PP02-IA-01-021612-FD	6L2606S	AIR	02/16/2012	11:57	732
L120607	PP02-SG-01-021612	6L2513S	AIR	02/16/2012	11:58	717
L120608	PP02-SG-02-021612	6L2501S	AIR	02/16/2012	12:00	571
L120609	PP02-AA-01-021612	6L2646A	AIR	02/16/2012	12:15	665

II. Holding Times:
All acceptance criteria were met.

III. Analysis:

A. Calibration:
All acceptance criteria were met.

B. Blanks:
All acceptance criteria were met.

C. Duplicate Sample(s):
All acceptance criteria were met.

D. Instrument Performance Check:
All acceptance criteria were met.

E. Surrogate Recoveries:
All acceptance criteria were met.

F. Internal Standards:
All acceptance criteria were met.

G. Laboratory Control Sample (LCS):
All acceptance criteria were met.

H. Matrix Spike(MS)/Matrix Spike Duplicate(MSD):
Not applicable.

IV. Sampling Equipment Exceptions:
None.

V. Analytical Exceptions:
Due to a laboratory error, sample PP03-IA-01-021512 (L120601) was compromised. Client requested that sample not be included in this report. Also, several samples in this batch had peak interference with the quantitative ion of cis-1,2-DCE. The quantitative ion was integrated to match the qualifier ion ratios due to lack of inflection points between the interference and the target peaks.

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designee, as verified by the following signature.

Prepared By: _____ Date: 3/5/12

Reviewed By: _____ Date: 3-07-12

SAMPLE DATA
SUMMARY

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP03-SG-01-021512

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120602

Lab File ID: L120602.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.72

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00894	0.0894	0.0894	U
75-09-2	Methylene chloride	0.0304	3.04	0.0823	J
156-60-5	trans-1,2-Dichloroethene	0.0139	0.139	0.0362	J
156-59-2	cis-1,2-Dichloroethene	0.0347	0.139	0.0589	J
67-66-3	Chloroform	0.0171	0.171	1.00	
107-06-2	1,2-Dichloroethane	0.0142	0.142	0.0145	J
56-23-5	Carbon tetrachloride	0.0220	0.220	0.0723	J
71-43-2	Benzene	0.0112	0.112	0.180	
79-01-6	Trichloroethene (TCE)	0.0188	0.188	0.407	
79-00-5	1,1,2-Trichloroethane	0.0191	0.191	0.191	U
127-18-4	Tetrachloroethene (PCE)	0.0237	0.237	2.28	
79-34-5	1,1,2,2-Tetrachloroethane	0.0240	0.240	0.240	U
91-20-3	Naphthalene	0.0917	0.183	0.162	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP03-SG-01-021512-FD

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120603

Lab File ID: L120603.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.64

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00853	0.0853	0.0853	U
75-09-2	Methylene chloride	0.0290	2.90	0.0682	J
156-60-5	trans-1,2-Dichloroethene	0.0132	0.132	0.132	U
156-59-2	cis-1,2-Dichloroethene	0.0331	0.132	0.132	U
67-66-3	Chloroform	0.0163	0.163	1.02	
107-06-2	1,2-Dichloroethane	0.0135	0.135	0.135	U
56-23-5	Carbon tetrachloride	0.0210	0.210	0.0730	J
71-43-2	Benzene	0.0107	0.107	0.194	
79-01-6	Trichloroethene (TCE)	0.0179	0.179	0.404	
79-00-5	1,1,2-Trichloroethane	0.0182	0.182	0.0296	J
127-18-4	Tetrachloroethene (PCE)	0.0226	0.226	2.19	
79-34-5	1,1,2,2-Tetrachloroethane	0.0229	0.229	0.0789	J
91-20-3	Naphthalene	0.0874	0.175	0.188	

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP03-AA-01-021512

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120604

Lab File ID: L120604.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.64

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00853	0.0853	0.0853	U
75-09-2	Methylene chloride	0.0290	2.90	0.331	J
156-60-5	trans-1,2-Dichloroethene	0.0132	0.132	0.132	U
156-59-2	cis-1,2-Dichloroethene	0.0331	0.132	0.132	U
67-66-3	Chloroform	0.0163	0.163	0.113	J
107-06-2	1,2-Dichloroethane	0.0135	0.135	0.0774	J
56-23-5	Carbon tetrachloride	0.0210	0.210	0.525	
71-43-2	Benzene	0.0107	0.107	0.884	
79-01-6	Trichloroethene (TCE)	0.0179	0.179	0.0639	J
79-00-5	1,1,2-Trichloroethane	0.0182	0.182	0.0910	J
127-18-4	Tetrachloroethene (PCE)	0.0226	0.226	0.134	J
79-34-5	1,1,2,2-Tetrachloroethane	0.0229	0.229	0.229	U
91-20-3	Naphthalene	0.0874	0.175	0.131	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-IA-01-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120605

Lab File ID: L120605.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.83

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00952	0.0952	0.0952	U
75-09-2	Methylene chloride	0.0323	3.23	0.749	J
156-60-5	trans-1,2-Dichloroethene	0.0148	0.148	0.148	U
156-59-2	cis-1,2-Dichloroethene	0.0369	0.148	0.148	U
67-66-3	Chloroform	0.0182	0.182	0.556	
107-06-2	1,2-Dichloroethane	0.0151	0.151	0.0770	J
56-23-5	Carbon tetrachloride	0.0234	0.234	0.548	
71-43-2	Benzene	0.0119	0.119	1.58	
79-01-6	Trichloroethene (TCE)	0.0200	0.200	0.181	J
79-00-5	1,1,2-Trichloroethane	0.0203	0.203	0.203	U
127-18-4	Tetrachloroethene (PCE)	0.0252	0.252	0.319	
79-34-5	1,1,2,2-Tetrachloroethane	0.0256	0.256	0.256	U
91-20-3	Naphthalene	0.0976	0.195	0.0981	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-IA-01-021612-FD

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120606

Lab File ID: L120606.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.41

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00733	0.0733	0.0733	U
75-09-2	Methylene chloride	0.0249	2.49	0.671	J
156-60-5	trans-1,2-Dichloroethene	0.0114	0.114	0.114	U
156-59-2	cis-1,2-Dichloroethene	0.0284	0.114	0.0452	J
67-66-3	Chloroform	0.0140	0.140	0.576	
107-06-2	1,2-Dichloroethane	0.0116	0.116	0.0774	J
56-23-5	Carbon tetrachloride	0.0180	0.180	0.525	
71-43-2	Benzene	0.00916	0.0916	1.52	
79-01-6	Trichloroethene (TCE)	0.0154	0.154	0.163	
79-00-5	1,1,2-Trichloroethane	0.0157	0.157	0.157	U
127-18-4	Tetrachloroethene (PCE)	0.0195	0.195	0.308	
79-34-5	1,1,2,2-Tetrachloroethane	0.0197	0.197	0.197	U
91-20-3	Naphthalene	0.0752	0.150	0.531	

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-SG-01-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120607

Lab File ID: L120607.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 03/01/12

Dilution Factor: 1.47

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00764	0.0764	0.0502	J
75-09-2	Methylene chloride	0.0260	2.60	0.0689	J
156-60-5	trans-1,2-Dichloroethene	0.0119	0.119	0.115	J
156-59-2	cis-1,2-Dichloroethene	0.0296	0.119	11.0	
67-66-3	Chloroform	0.0146	0.146	9.14	
107-06-2	1,2-Dichloroethane	0.0121	0.121	0.0239	J
56-23-5	Carbon tetrachloride	0.0188	0.188	0.548	
71-43-2	Benzene	0.00955	0.0955	0.226	
79-01-6	Trichloroethene (TCE)	0.0161	0.161	40.0	
79-00-5	1,1,2-Trichloroethane	0.0163	0.163	0.163	U
127-18-4	Tetrachloroethene (PCE)	0.0203	0.203	8.42	
79-34-5	1,1,2,2-Tetrachloroethane	0.0205	0.205	0.121	J
91-20-3	Naphthalene	0.0784	0.157	0.100	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-SG-02-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120608

Lab File ID: L120608.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 03/01/12

Dilution Factor: 1.83

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00952	0.0952	0.215	
75-09-2	Methylene chloride	0.0323	3.23	0.0936	J
156-60-5	trans-1,2-Dichloroethene	0.0148	0.148	0.0468	J
156-59-2	cis-1,2-Dichloroethene	0.0369	0.148	0.774	
67-66-3	Chloroform	0.0182	0.182	0.0631	J
107-06-2	1,2-Dichloroethane	0.0151	0.151	0.151	U
56-23-5	Carbon tetrachloride	0.0234	0.234	0.415	
71-43-2	Benzene	0.0119	0.119	0.159	
79-01-6	Trichloroethene (TCE)	0.0200	0.200	0.315	
79-00-5	1,1,2-Trichloroethane	0.0203	0.203	0.203	U
127-18-4	Tetrachloroethene (PCE)	0.0252	0.252	1.52	
79-34-5	1,1,2,2-Tetrachloroethane	0.0256	0.256	0.0999	J
91-20-3	Naphthalene	0.0976	0.195	0.901	

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-AA-01-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120609

Lab File ID: L120609.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 03/01/12

Dilution Factor: 1.6

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00832	0.0832	0.0502	J
75-09-2	Methylene chloride	0.0283	2.83	0.544	J
156-60-5	trans-1,2-Dichloroethene	0.0129	0.129	0.0364	J
156-59-2	cis-1,2-Dichloroethene	0.0323	0.129	0.320	
67-66-3	Chloroform	0.0159	0.159	0.235	
107-06-2	1,2-Dichloroethane	0.0132	0.132	0.0758	J
56-23-5	Carbon tetrachloride	0.0205	0.205	0.538	
71-43-2	Benzene	0.0104	0.104	1.70	
79-01-6	Trichloroethene (TCE)	0.0175	0.175	0.181	
79-00-5	1,1,2-Trichloroethane	0.0178	0.178	0.178	U
127-18-4	Tetrachloroethene (PCE)	0.0221	0.221	0.195	J
79-34-5	1,1,2,2-Tetrachloroethane	0.0223	0.223	0.223	U
91-20-3	Naphthalene	0.0853	0.171	0.172	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **XB1-0229**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: XB1-0229

Lab File ID: XB1-0229.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/29/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0650	U
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP03-SG-01-021512

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120602

Lab File ID: L120602.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.72

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00344	0.0344	0.0344	U
75-09-2	Methylene chloride	0.00860	0.860	0.0233	J
156-60-5	trans-1,2-Dichloroethene	0.00344	0.0344	0.00898	J
156-59-2	cis-1,2-Dichloroethene	0.00860	0.0344	0.0146	J
67-66-3	Chloroform	0.00344	0.0344	0.202	
107-06-2	1,2-Dichloroethane	0.00344	0.0344	0.00352	J
56-23-5	Carbon tetrachloride	0.00344	0.0344	0.0113	J
71-43-2	Benzene	0.00344	0.0344	0.0553	
79-01-6	Trichloroethene (TCE)	0.00344	0.0344	0.0745	
79-00-5	1,1,2-Trichloroethane	0.00344	0.0344	0.0344	U
127-18-4	Tetrachloroethene (PCE)	0.00344	0.0344	0.330	
79-34-5	1,1,2,2-Tetrachloroethane	0.00344	0.0344	0.0344	U
91-20-3	Naphthalene	0.0172	0.0344	0.0304	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP03-SG-01-021512-FD

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120603

Lab File ID: L120603.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.64

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00328	0.0328	0.0328	U
75-09-2	Methylene chloride	0.00820	0.820	0.0193	J
156-60-5	trans-1,2-Dichloroethene	0.00328	0.0328	0.0328	U
156-59-2	cis-1,2-Dichloroethene	0.00820	0.0328	0.0328	U
67-66-3	Chloroform	0.00328	0.0328	0.206	
107-06-2	1,2-Dichloroethane	0.00328	0.0328	0.0328	U
56-23-5	Carbon tetrachloride	0.00328	0.0328	0.0114	J
71-43-2	Benzene	0.00328	0.0328	0.0598	
79-01-6	Trichloroethene (TCE)	0.00328	0.0328	0.074	
79-00-5	1,1,2-Trichloroethane	0.00328	0.0328	0.00533	J
127-18-4	Tetrachloroethene (PCE)	0.00328	0.0328	0.317	
79-34-5	1,1,2,2-Tetrachloroethane	0.00328	0.0328	0.0113	J
91-20-3	Naphthalene	0.0164	0.0328	0.0352	

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP03-AA-01-021512

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120604

Lab File ID: L120604.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.64

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00328	0.0328	0.0328	U
75-09-2	Methylene chloride	0.00820	0.820	0.0937	J
156-60-5	trans-1,2-Dichloroethene	0.00328	0.0328	0.0328	U
156-59-2	cis-1,2-Dichloroethene	0.00820	0.0328	0.0328	U
67-66-3	Chloroform	0.00328	0.0328	0.0227	J
107-06-2	1,2-Dichloroethane	0.00328	0.0328	0.0188	J
56-23-5	Carbon tetrachloride	0.00328	0.0328	0.0821	
71-43-2	Benzene	0.00328	0.0328	0.272	
79-01-6	Trichloroethene (TCE)	0.00328	0.0328	0.0117	J
79-00-5	1,1,2-Trichloroethane	0.00328	0.0328	0.0164	J
127-18-4	Tetrachloroethene (PCE)	0.00328	0.0328	0.0194	J
79-34-5	1,1,2,2-Tetrachloroethane	0.00328	0.0328	0.0328	U
91-20-3	Naphthalene	0.0164	0.0328	0.0246	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **PP02-IA-01-021612**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120605

Lab File ID: L120605.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.83

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00366	0.0366	0.0366	U
75-09-2	Methylene chloride	0.00915	0.915	0.212	J
156-60-5	trans-1,2-Dichloroethene	0.00366	0.0366	0.0366	U
156-59-2	cis-1,2-Dichloroethene	0.00915	0.0366	0.0366	U
67-66-3	Chloroform	0.00366	0.0366	0.112	
107-06-2	1,2-Dichloroethane	0.00366	0.0366	0.0187	J
56-23-5	Carbon tetrachloride	0.00366	0.0366	0.0856	
71-43-2	Benzene	0.00366	0.0366	0.485	
79-01-6	Trichloroethene (TCE)	0.00366	0.0366	0.0332	J
79-00-5	1,1,2-Trichloroethane	0.00366	0.0366	0.0366	U
127-18-4	Tetrachloroethene (PCE)	0.00366	0.0366	0.0463	
79-34-5	1,1,2,2-Tetrachloroethane	0.00366	0.0366	0.0366	U
91-20-3	Naphthalene	0.0183	0.0366	0.0184	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-IA-01-021612-FD

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120606

Lab File ID: L120606.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 02/29/12

Dilution Factor: 1.41

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00282	0.0282	0.0282	U
75-09-2	Methylene chloride	0.00705	0.705	0.190	J
156-60-5	trans-1,2-Dichloroethene	0.00282	0.0282	0.0282	U
156-59-2	cis-1,2-Dichloroethene	0.00705	0.0282	0.0112	J
67-66-3	Chloroform	0.00282	0.0282	0.116	
107-06-2	1,2-Dichloroethane	0.00282	0.0282	0.0188	J
56-23-5	Carbon tetrachloride	0.00282	0.0282	0.082	
71-43-2	Benzene	0.00282	0.0282	0.468	
79-01-6	Trichloroethene (TCE)	0.00282	0.0282	0.0298	
79-00-5	1,1,2-Trichloroethane	0.00282	0.0282	0.0282	U
127-18-4	Tetrachloroethene (PCE)	0.00282	0.0282	0.0447	
79-34-5	1,1,2,2-Tetrachloroethane	0.00282	0.0282	0.0282	U
91-20-3	Naphthalene	0.0141	0.0282	0.0996	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-SG-01-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120607

Lab File ID: L120607.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 03/01/12

Dilution Factor: 1.47

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00294	0.0294	0.0193	J
75-09-2	Methylene chloride	0.00735	0.735	0.0195	J
156-60-5	trans-1,2-Dichloroethene	0.00294	0.0294	0.0284	J
156-59-2	cis-1,2-Dichloroethene	0.00735	0.0294	2.740	
67-66-3	Chloroform	0.00294	0.0294	1.840	
107-06-2	1,2-Dichloroethane	0.00294	0.0294	0.00581	J
56-23-5	Carbon tetrachloride	0.00294	0.0294	0.0857	
71-43-2	Benzene	0.00294	0.0294	0.0694	
79-01-6	Trichloroethene (TCE)	0.00294	0.0294	7.330	
79-00-5	1,1,2-Trichloroethane	0.00294	0.0294	0.0294	U
127-18-4	Tetrachloroethene (PCE)	0.00294	0.0294	1.220	
79-34-5	1,1,2,2-Tetrachloroethane	0.00294	0.0294	0.0173	J
91-20-3	Naphthalene	0.0147	0.0294	0.0188	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-SG-02-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120608

Lab File ID: L120608.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 03/01/12

Dilution Factor: 1.83

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00366	0.0366	0.0825	
75-09-2	Methylene chloride	0.00915	0.915	0.0265	J
156-60-5	trans-1,2-Dichloroethene	0.00366	0.0366	0.0116	J
156-59-2	cis-1,2-Dichloroethene	0.00915	0.0366	0.192	
67-66-3	Chloroform	0.00366	0.0366	0.0127	J
107-06-2	1,2-Dichloroethane	0.00366	0.0366	0.0366	U
56-23-5	Carbon tetrachloride	0.00366	0.0366	0.0648	
71-43-2	Benzene	0.00366	0.0366	0.049	
79-01-6	Trichloroethene (TCE)	0.00366	0.0366	0.0577	
79-00-5	1,1,2-Trichloroethane	0.00366	0.0366	0.0366	U
127-18-4	Tetrachloroethene (PCE)	0.00366	0.0366	0.220	
79-34-5	1,1,2,2-Tetrachloroethane	0.00366	0.0366	0.0143	J
91-20-3	Naphthalene	0.0183	0.0366	0.169	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: PP02-AA-01-021612

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: L120609

Lab File ID: L120609.D

Level: (LOW/MED) LOW

Date Received: 02/20/12

Date Analyzed: 03/01/12

Dilution Factor: 1.6

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00320	0.032	0.0193	J
75-09-2	Methylene chloride	0.008	0.800	0.154	J
156-60-5	trans-1,2-Dichloroethene	0.00320	0.032	0.00903	J
156-59-2	cis-1,2-Dichloroethene	0.008	0.032	0.0794	
67-66-3	Chloroform	0.00320	0.032	0.0474	
107-06-2	1,2-Dichloroethane	0.00320	0.032	0.0184	J
56-23-5	Carbon tetrachloride	0.00320	0.032	0.0841	
71-43-2	Benzene	0.00320	0.032	0.522	
79-01-6	Trichloroethene (TCE)	0.00320	0.032	0.0332	
79-00-5	1,1,2-Trichloroethane	0.00320	0.032	0.032	U
127-18-4	Tetrachloroethene (PCE)	0.00320	0.032	0.0282	J
79-34-5	1,1,2,2-Tetrachloroethane	0.00320	0.032	0.032	U
91-20-3	Naphthalene	0.016	0.032	0.0322	

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **XB1-0229**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: XB1-0229

Lab File ID: XB1-0229.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/29/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.020	U
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

QC DATA
SUMMARY

AIR VOLATILE SURROGATE RECOVERY

SDG No.: L1206 Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSG

	Field/QC Sample ID	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	# Out
1	BS1X0229	100	105											
2	XB1-0229	97	86											
3	PP03-SG-01-021512	102	108											
4	PP03-SG-01-021512-FD	100	104											
5	PP03-AA-01-021512	98	107											
6	PP02-IA-01-021612	98	104											
7	PP02-IA-01-021612-FD	100	106											
8	PP02-SG-01-021612	100	104											
9	PP02-SG-02-021612	98	106											
10	PP02-AA-01-021612	97	102											

* Values outside of QC limits

D Surrogate diluted out

	QC Limits
S1: Toluene-d8	(70-130)
S2: 4-Bromofluorobenzene	(70-130)

AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: L1206 Lab Name: CH2M_HILL/LAB/CVO

Analysis Method: TO15 SIM Blank Spike ID: BS1X0229

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSG

Analyte	Spike Added (ug/m3)	BS Result (ug/m3)	%R	QC Limits %R	Q
Naphthalene	2.67	1.98	74	70-130	
Vinyl Chloride	1.30	1.13	87	70-130	
Methylene chloride	1.77	1.38	78	70-130	
trans-1,2-Dichloroethene	2.02	1.77	88	70-130	
cis-1,2-Dichloroethene	2.02	1.72	85	70-130	
Chloroform	2.48	2.27	91	70-130	
1,2-Dichloroethane	2.06	1.90	92	70-130	
Carbon tetrachloride	3.20	3.09	97	70-130	
Benzene	1.62	1.31	81	70-130	
Trichloroethene (TCE)	2.73	2.46	90	70-130	
1,1,2-Trichloroethane	2.77	2.49	90	70-130	
Tetrachloroethene (PCE)	3.45	3.09	90	70-130	
1,1,2,2-Tetrachloroethane	3.49	3.23	92	70-130	

* Values outside of QC limits

Comments:

AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: L1206 Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM Blank Spike ID: BS1X0229

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSG

Analyte	Spike Added (ppbv)	BS Result (ppbv)	%R	QC Limits %R	Q
Naphthalene	0.500	0.372	74	70-130	
Vinyl Chloride	0.500	0.434	87	70-130	
Methylene chloride	0.500	0.390	78	70-130	
trans-1,2-Dichloroethene	0.500	0.440	88	70-130	
cis-1,2-Dichloroethene	0.500	0.427	85	70-130	
Chloroform	0.500	0.457	91	70-130	
1,2-Dichloroethane	0.500	0.461	92	70-130	
Carbon tetrachloride	0.500	0.483	97	70-130	
Benzene	0.500	0.404	81	70-130	
Trichloroethene (TCE)	0.500	0.451	90	70-130	
1,1,2-Trichloroethane	0.500	0.448	90	70-130	
Tetrachloroethene (PCE)	0.500	0.448	90	70-130	
1,1,2,2-Tetrachloroethane	0.500	0.462	92	70-130	

* Values outside of QC limits

Comments:

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID: XB1-0229

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM

Lab Sample ID: XB1-0229

Lab File ID: XB1-0229.D

Date Analyzed: 02/29/12

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1724

Instrument Name: MSG

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	Field Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
1	BS1X0229	BS1X0229	BS1X0229.D	02/29/12	1557
2	PP03-SG-01-021512	L120602	L120602.D	02/29/12	2019
3	PP03-SG-01-021512-FD	L120603	L120603.D	02/29/12	2103
4	PP03-AA-01-021512	L120604	L120604.D	02/29/12	2147
5	PP02-IA-01-021612	L120605	L120605.D	02/29/12	2232
6	PP02-IA-01-021612-FD	L120606	L120606.D	02/29/12	2317
7	PP02-SG-01-021612	L120607	L120607.D	03/01/12	0001
8	PP02-SG-02-021612	L120608	L120608.D	03/01/12	0046
9	PP02-AA-01-021612	L120609	L120609.D	03/01/12	0130

Comments:

5B

VOLATILE ORGANIC RUN LOG

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15_SIM

Lab File ID: T1-0227.D

Instrument ID: MSG

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	Field Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
1	LEVEL1	LEVEL1	LEVEL1D.D	02/27/12	1543
2	LEVEL2	LEVEL2	LEVEL2.D	02/27/12	1628
3	LEVEL3	LEVEL3	LEVEL3.D	02/27/12	1712
4	LEVEL4	LEVEL4	LEVEL4.D	02/27/12	1755
5	LEVEL5	LEVEL5	LEVEL5.D	02/27/12	1838
6	LEVEL6	LEVEL6	LEVEL6.D	02/27/12	1923
7	LEVEL7	LEVEL7	LEVEL7.D	02/27/12	2006
8	LEVEL8	LEVEL8	LEVEL8.D	02/27/12	2050

5B

VOLATILE ORGANIC RUN LOG

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM

Lab File ID: T1-0229.D

Instrument ID: MSG

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	Field Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
1	CV1-0229	CV1-0229	CV1-0229.D	02/29/12	1513
2	BS1X0229	BS1X0229	BS1X0229.D	02/29/12	1557
3	XB1-0229	XB1-0229	XB1-0229.D	02/29/12	1724
4	PP03-SG-01-021512	L120602	L120602.D	02/29/12	2019
5	PP03-SG-01-021512-FD	L120603	L120603.D	02/29/12	2103
6	PP03-AA-01-021512	L120604	L120604.D	02/29/12	2147
7	PP02-IA-01-021612	L120605	L120605.D	02/29/12	2232
8	PP02-IA-01-021612-FD	L120606	L120606.D	02/29/12	2317
9	PP02-SG-01-021612	L120607	L120607.D	03/01/12	0001
10	PP02-SG-02-021612	L120608	L120608.D	03/01/12	0046
11	PP02-AA-01-021612	L120609	L120609.D	03/01/12	0130

5B

VOLATILE ORGANIC RUN LOG

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM

Lab File ID: T1-0228.D

Instrument ID: MSG

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	Field Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
1	ICV20228	ICV20228	ICV20228.D	02/28/12	1756

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: L1206 Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM Calibration Date(s): 02/27/12 02/27/12

Instrument Name: MSG Calibration Times: 1543 2050

Heat Purge: (Y/N) N Concentration Units: ppbv

ICAL Sample IDs:	LEVEL1	LEVEL2	LEVEL3	LEVEL4	LEVEL5	LEVEL6
ICAL File IDs:	LEVEL1D.D	LEVEL2.D	LEVEL3.D	LEVEL4.D	LEVEL5.D	LEVEL6.D

Analyte	Std 1	RF 1	Std 2	RF 2	Std 3	RF 3	Std 4	RF 4	Std 5	RF 5	Std 6	RF 6
Bromochloromethane	.1	1.000	.1	1.000	.1	1.000	.1	1.000	.1	1.000	.1	1.000
Vinyl Chloride	.004	1.030	.01	0.785	.02	0.959	.05	1.014	.25	1.078	.5	0.745
Methylene chloride	.004	1.334	.01	1.218	.02	1.440	.05	1.308	.25	1.313	.5	0.904
trans-1,2-Dichloroethene	.004	1.191	.01	1.089	.02	1.474	.05	1.627	.25	1.713	.5	1.145
cis-1,2-Dichloroethene	.004	1.140	.01	1.086	.02	1.420	.05	1.533	.25	1.645	.5	1.042
Chloroform	.004	1.672	.01	1.671	.02	2.023	.05	2.266	.25	2.501	.5	1.735
1,2-Dichloroethane	.004	1.005	.01	1.018	.02	1.280	.05	1.436	.25	1.579	.5	1.098
Carbon tetrachloride	.004	1.309	.01	1.285	.02	1.837	.05	2.029	.25	2.226	.5	1.493
Benzene	.004	4.222	.01	3.209	.02	3.350	.05	3.472	.25	3.621	.5	2.511
1,4-difluorobenzene	.1	1.000	.1	1.000	.1	1.000	.1	1.000	.1	1.000	.1	1.000
Trichloroethene (TCE)	.004	0.264	.01	0.269	.02	0.340	.05	0.367	.25	0.376	.5	0.281
1,1,2-Trichloroethane	.004	0.221	.01	0.233	.02	0.296	.05	0.316	.25	0.338	.5	0.241
Toluene-d8	.1	1.000	.1	1.004	.1	1.021	.1	1.014	.1	1.010	.1	1.010
Tetrachloroethene (PCE)	.004	0.356	.01	0.363	.02	0.457	.05	0.489	.25	0.510	.5	0.373
Chlorobenzene-d5	.1	1.000	.1	1.000	.1	1.000	.1	1.000	.1	1.000	.1	1.000
1,1,2,2-Tetrachloroethane	.004	0.429	.01	0.472	.02	0.567	.05	0.661	.25	0.711	.5	0.497
4-Bromofluorobenzene	.1	0.466	.1	0.476	.1	0.489	.1	0.511	.1	0.532	.1	0.543
Naphthalene	.004	0.992	.01	0.969	.02	0.736	.05	0.875	.25	0.895	.5	0.506

* SPCC # CCC

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15_SIM

Calibration Date(s): 02/27/12 02/27/12

Instrument Name: MSG

Calibration Times: 1543 2050

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: LEVEL7 LEVEL8

ICAL File IDs: LEVEL7.D LEVEL8.D

Analyte	Std 7	RF 7	Std 8	RF 8	Std 9	RF 9						
Bromochloromethane	.1	1.000	.1	1.000								
Vinyl Chloride	2	0.702	5	0.607								
Methylene chloride	2	0.885	5	0.840								
trans-1,2-Dichloroethene	2	1.131	5	1.082								
cis-1,2-Dichloroethene	2	1.082	5	1.057								
Chloroform	2	1.634	5	1.559								
1,2-Dichloroethane	2	1.105	5	1.060								
Carbon tetrachloride	2	1.471	5	1.343								
Benzene	2	2.478	5	2.351								
1,4-difluorobenzene	.1	1.000	.1	1.000								
Trichloroethene (TCE)	2	0.275	5	0.273								
1,1,2-Trichloroethane	2	0.243	5	0.239								
Toluene-d8	.1	1.030	.1	1.041								
Tetrachloroethene (PCE)	2	0.365	5	0.363								
Chlorobenzene-d5	.1	1.000	.1	1.000								
1,1,2,2-Tetrachloroethane	2	0.509	5	0.487								
4-Bromofluorobenzene	.1	0.557	.1	0.562								
Naphthalene	2	0.548	5	0.534								

* SPCC # CCC

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: L1206 Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM Calibration Date(s): 02/27/12 02/27/12

Instrument Name: MSG Calibration Times: 1543 2050

Heat Purge: (Y/N) N Concentration Units: ppbv

Analyte	Curve Type	Avg. RF	%RSD	Mean %RSD	r	COD	Q
Bromochloromethane	AVG	1.000	0.00	19.4			
Vinyl Chloride	AVG	0.865	20.4	19.4			
Methylene chloride	AVG	1.155	20.7	19.4			
trans-1,2-Dichloroethene	AVG	1.307	19.7	19.4			
cis-1,2-Dichloroethene	AVG	1.250	19.4	19.4			
Chloroform	AVG	1.882	18.3	19.4			
1,2-Dichloroethane	AVG	1.197	17.7	19.4			
Carbon tetrachloride	AVG	1.624	22.2	19.4			
Benzene	AVG	3.152	20.8	19.4			
1,4-difluorobenzene	AVG	1.000	0.00	19.4			
Trichloroethene (TCE)	AVG	0.306	15.4	19.4			
1,1,2-Trichloroethane	AVG	0.266	16.6	19.4			
Toluene-d8	AVG	1.016	1.34	19.4			
Tetrachloroethene (PCE)	AVG	0.409	15.8	19.4			
Chlorobenzene-d5	AVG	1.000	0.00	19.4			
1,1,2,2-Tetrachloroethane	AVG	0.541	18.1	19.4			
4-Bromofluorobenzene	AVG	0.517	7.19	19.4			
Naphthalene	AVG	0.757	26.9	19.4			

* SPCC # CCC

VOLATILE INITIAL CALIBRATION CHECK

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM

Calibration Date/Time: 02/28/12 1756

Instrument ID: MSG

Init. Calib. Date(s): 02/27/12 02/27/12

2nd Source ID: ICV20228

Init. Calib. Time(s): 1543 2050

Lab File ID: ICV20228.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

Analyte	Expected	Found	RRF	Min. RRF	%D	Max. %D	Q
Vinyl Chloride	0.500	0.430	0.744	0.000	-14.0	30	
Methylene chloride	0.500	0.354	0.818	0.000	-29.2	30	
trans-1,2-Dichloroethene	0.500	0.388	1.015	0.000	-22.3	30	
cis-1,2-Dichloroethene	0.500	0.398	0.996	0.000	-20.3	30	
Chloroform	0.500	0.424	1.597	0.000	-15.2	30	
1,2-Dichloroethane	0.500	0.442	1.058	0.000	-11.7	30	
Carbon tetrachloride	0.500	0.489	1.588	0.000	-2.21	30	
Benzene	0.500	0.377	2.377	0.000	-24.6	30	
Trichloroethene (TCE)	0.500	0.408	0.249	0.000	-18.4	30	
1,1,2-Trichloroethane	0.500	0.445	0.236	0.000	-11.0	30	
Tetrachloroethene (PCE)	0.500	0.424	0.347	0.000	-15.3	30	
1,1,2,2-Tetrachloroethane	0.500	0.539	0.583	0.000	7.72	30	
Naphthalene	0.500	0.528	0.799	0.000	5.55	30	

* SPCC # CCC

VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: L1206

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: TO15 SIM

Calibration Date/Time: 02/29/12 1513

Instrument ID: MSG

Init. Calib. Date(s): 02/27/12 02/27/12

Cal Check ID: CV1-0229

Init. Calib. Time(s): 1543 2050

Lab File ID: CV1-0229.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

Analyte	Expected	Found	RRF	Min. RRF	%D	Max. %D	Q
Vinyl Chloride	0.500	0.440	0.761	0.000	-12.0	30	
Methylene chloride	0.500	0.399	0.923	0.000	-20.1	30	
trans-1,2-Dichloroethene	0.500	0.445	1.163	0.000	-11.0	30	
cis-1,2-Dichloroethene	0.500	0.437	1.092	0.000	-12.7	30	
Chloroform	0.500	0.449	1.690	0.000	-10.2	30	
1,2-Dichloroethane	0.500	0.467	1.118	0.000	-6.66	30	
Carbon tetrachloride	0.500	0.485	1.576	0.000	-2.96	30	
Benzene	0.500	0.412	2.598	0.000	-17.6	30	
Trichloroethene (TCE)	0.500	0.456	0.278	0.000	-8.88	30	
1,1,2-Trichloroethane	0.500	0.447	0.238	0.000	-10.5	30	
Toluene-d8	0.100	0.100	1.017	0.000	0.03	30	
Tetrachloroethene (PCE)	0.500	0.441	0.361	0.000	-11.7	30	
1,1,2,2-Tetrachloroethane	0.500	0.459	0.497	0.000	-8.26	30	
4-Bromofluorobenzene	0.100	0.104	0.537	0.000	3.83	30	
Naphthalene	0.500	0.369	0.559	0.000	-26.1	30	

* SPCC # CCC

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: L1206

Analysis Method: TO15 SIM

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: LEVEL6

Date Analyzed: 02/27/12

Lab File ID: LEVEL6.D

Time Analyzed: 1923

Instrument Name: MSG

Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

		IS1		IS2		IS3	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
Reference Cal		3170	14.85	13220	16.53	11637	20.85
Upper Limit		6340	15.35	26440	17.03	23274	21.35
Lower Limit		1585	14.35	6610	16.03	5819	20.35
Field Sample ID	Lab Sample ID						
ICV20228	ICV20228	3105	14.85	12881	16.53	11101	20.86
CV1-0229	CV1-0229	3264	14.85	13880	16.53	12152	20.86
BS1X0229	BS1X0229	3202	14.85	13560	16.52	11777	20.86
XB1-0229	XB1-0229	2893	14.87	11685	16.54	9642	20.86
PP03-SG-01-021512	L120602	2491	14.85	11673	16.52	10444	20.86
PP03-SG-01-021512-FD	L120603	2606	14.84	12054	16.53	10539	20.85
PP03-AA-01-021512	L120604	2742	14.85	12248	16.52	10671	20.86
PP02-IA-01-021612	L120605	2721	14.83	12466	16.51	10644	20.85
PP02-IA-01-021612-FD	L120606	2755	14.84	12340	16.52	10695	20.86
PP02-SG-01-021612	L120607	2766	14.84	12527	16.52	10635	20.86
PP02-SG-02-021612	L120608	2806	14.84	12379	16.52	10794	20.86
PP02-AA-01-021612	L120609	2725	14.84	12338	16.52	10824	20.86

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

Column used to flag values outside of QC limits with an asterisk

SAMPLE EQUIPMENT CERTIFICATION

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2470A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2470A

Lab File ID: 6L2470A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.00855	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2501S

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2501S

Lab File ID: 6L2501S

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0544	J
67-66-3	Chloroform	0.00990	0.0993	0.0119	J
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.0155	J
71-43-2	Benzene	0.00650	0.0650	0.0137	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2513S

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2513S

Lab File ID: 6L2513S.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0127	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2557A**

SDG No.: L1206

Analysis Method: TO15_SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2557A

Lab File ID: 6L2557A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.00822	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2606S

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2606S

Lab File ID: 6L2606S.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0139	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2644A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2644A

Lab File ID: 6L2644A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0120	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2646A

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2646A

Lab File ID: 6L2646A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/08/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.00832	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2712A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2712A

Lab File ID: 6L2712A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0145	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.0286	J
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3918B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3918B

Lab File ID: FC3918B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0244	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.0115	J
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.0193	J
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: FC3935B

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3935B

Lab File ID: FC3935B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0146	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3949B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3949B

Lab File ID: FC3949B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0286	J
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.00946	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3961B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3961B

Lab File ID: FC3961B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0132	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3979B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3979B

Lab File ID: FC3979B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	0.0186	J
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0286	J
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0202	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.0208	J
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: FC3983B

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3983B

Lab File ID: FC3983B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0172	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.0127	J
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3986B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3986B

Lab File ID: FC3986B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	0.0341	J
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0118	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.0120	J
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3987B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3987B

Lab File ID: FC3987B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0242	J
75-09-2	Methylene chloride	0.0177	1.77	0.0206	J
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0766	J
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0100	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.0229	J
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: XB1-0206

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: XB1-0206

Lab File ID: XB1-0206.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.0148	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: XB1-0207

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: XB1-0207

Lab File ID: XB1-0207.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ug/m3

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.00520	0.0520	0.0520	U
75-09-2	Methylene chloride	0.0177	1.77	1.77	U
156-60-5	trans-1,2-Dichloroethene	0.00810	0.0807	0.0807	U
156-59-2	cis-1,2-Dichloroethene	0.0202	0.0807	0.0807	U
67-66-3	Chloroform	0.00990	0.0993	0.0993	U
107-06-2	1,2-Dichloroethane	0.00820	0.0823	0.0823	U
56-23-5	Carbon tetrachloride	0.0128	0.128	0.128	U
71-43-2	Benzene	0.00650	0.0650	0.00718	J
79-01-6	Trichloroethene (TCE)	0.0109	0.109	0.109	U
79-00-5	1,1,2-Trichloroethane	0.0111	0.111	0.111	U
127-18-4	Tetrachloroethene (PCE)	0.0138	0.138	0.138	U
79-34-5	1,1,2,2-Tetrachloroethane	0.0140	0.140	0.140	U
91-20-3	Naphthalene	0.0533	0.107	0.107	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2470A

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2470A

Lab File ID: 6L2470A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00263	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2501S

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2501S

Lab File ID: 6L2501S

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.0135	J
67-66-3	Chloroform	0.002	0.020	0.00240	J
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.00243	J
71-43-2	Benzene	0.002	0.020	0.00423	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2513S

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2513S

Lab File ID: 6L2513S.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00390	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2557A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2557A

Lab File ID: 6L2557A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00253	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: 6L2606S

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2606S

Lab File ID: 6L2606S.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00427	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2644A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2644A

Lab File ID: 6L2644A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00369	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2646A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2646A

Lab File ID: 6L2646A.D

Level: (LOW/MED) LOW

Date Received: __/__/

Date Analyzed: 02/08/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00256	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **6L2712A**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: 6L2712A

Lab File ID: 6L2712A.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00445	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.00524	J
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3918B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3918B

Lab File ID: FC3918B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00752	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.00210	J
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.00280	J
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3935B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3935B

Lab File ID: FC3935B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00449	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3949B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3949B

Lab File ID: FC3949B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.00710	J
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00291	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3961B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3961B

Lab File ID: FC3961B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00405	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **FC3979B**

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3979B

Lab File ID: FC3979B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.00526	J
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.00709	J
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00622	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.00302	J
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: FC3983B

SDG No.: L1206

Analysis Method: TO15_SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3983B

Lab File ID: FC3983B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00530	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.00232	J
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: FC3986B

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3986B

Lab File ID: FC3986B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.00964	J
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00363	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.00219	J
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: FC3987B

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: FC3987B

Lab File ID: FC3987B.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.00929	J
75-09-2	Methylene chloride	0.005	0.500	0.00582	J
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.019	J
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00309	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.00419	J
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: XB1-0206

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: XB1-0206

Lab File ID: XB1-0206.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/06/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00456	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID: XB1-0207

SDG No.: L1206

Analysis Method: TO15 SIM

Matrix: AIR

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: XB1-0207

Lab File ID: XB1-0207.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 02/07/12

Dilution Factor: 1

Instrument: MSG

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: ppbv

CAS No.	Analyte	DL	PQL	Result	Q
75-01-4	Vinyl Chloride	0.002	0.020	0.020	U
75-09-2	Methylene chloride	0.005	0.500	0.500	U
156-60-5	trans-1,2-Dichloroethene	0.002	0.020	0.020	U
156-59-2	cis-1,2-Dichloroethene	0.005	0.020	0.020	U
67-66-3	Chloroform	0.002	0.020	0.020	U
107-06-2	1,2-Dichloroethane	0.002	0.020	0.020	U
56-23-5	Carbon tetrachloride	0.002	0.020	0.020	U
71-43-2	Benzene	0.002	0.020	0.00221	J
79-01-6	Trichloroethene (TCE)	0.002	0.020	0.020	U
79-00-5	1,1,2-Trichloroethane	0.002	0.020	0.020	U
127-18-4	Tetrachloroethene (PCE)	0.002	0.020	0.020	U
79-34-5	1,1,2,2-Tetrachloroethane	0.002	0.020	0.020	U
91-20-3	Naphthalene	0.010	0.020	0.020	U

CH2MHILL
Applied Sciences Laboratory (ASL)

CH2M HILL
Applied Sciences Labortory (ASL)
1000 NE Circle Blvd., Building 10
Suite 10350
Corvallis, OR 97330
Telephone: 541-768-3120
Fax: 541-752-0276

MDL Study Report

Analytical Method: TO15 SIM
Matrix: Air

Instrument ID: MSG
Concentration Units: PPTV

Analyte	Analysis Date	Amt. Spiked	Replicates								Std. Dev.	MDL
			1	2	3	4	5	6	7	8		
Vinyl Chloride	12/02/11	2.00	2.50	2.51	2.51	2.60	2.66	2.68	2.51		0.0783	2.00
Methylene chloride	12/02/11	5.00	6.31	6.78	6.54	9.85	6.98	6.89	6.99	6.63	1.13	5.00
trans-1,2-Dichloroethene	12/02/11	2.00	1.96	1.90	2.16	1.84	1.70	1.98	1.88		0.141	2.00
cis-1,2-Dichloroethene	12/02/11	10.0	11.3	11.5	11.4	11.3	11.5	11.6	8.79	11.3	0.930	5.00
Chloroform	12/02/11	1.00	1.35	1.25	1.21	1.34	1.38	1.22	1.30		0.0673	2.00
1,2-Dichloroethane	12/02/11	1.00	1.22	1.27	1.11	1.14	1.10	1.41	1.10		0.116	2.00
Carbon tetrachloride	12/02/11	1.00	1.22	1.25	1.17	1.48	1.27	1.28	1.13		0.112	2.00
Benzene	12/02/11	1.00	5.85	5.91	5.87	5.84	5.94	5.83	5.90		0.0407	2.00
Trichloroethene (TCE)	12/02/11	1.00	1.32	1.21	1.22	1.40	1.43	1.29	1.55		0.122	2.00
1,1,2-Trichloroethane	12/02/11	2.00	2.18	1.98	2.09	2.03	2.03	2.19	2.11		0.0793	2.00
Tetrachloroethene (PCE)	12/02/11	1.00	1.30	1.26	1.42	1.28	1.23	1.23	1.20		0.0725	2.00
1,1,2,2-Tetrachloroethane	12/02/11	5.00	9.25	9.00	9.10	9.27	9.44	9.48	9.07	9.02	0.186	2.00
Naphthalene	12/02/11	30.0	12.1	10.7	7.58	11.9	8.40	9.24	9.28		1.74	10.0

CHAIN OF CUSTODY/SHIPPING DOCUMENTS

CH2MHILL Applied Sciences Lab
CHAIN OF CUSTODY RECORD
AND AGREEMENT TO PERFORM SERVICES

1100 NE Circle Blvd., Suite 300
Corvallis, OR 97330
(541) 768-3120 FAX (541) 752-0276

COC # _____

Project # or Purchase Order # 364298.01.SL.VI.VM	
Project Name St. Louis Ordnance Plant	
Company Name or Home Address/Phone Number CH2M HILL/STL	
Email Address for Reporting Chris.english@ch2m.com	**Report Copy to:** Daniel.moore@critigen.com
Turnaround Time ☐24 hours ☐48 hours ☐72 hours ☐7 days ☐14 days ☒21 days (STD)	**Drinking Water?** Yes ☐ No ☒ — **Sample Disposal:** Dispose ☒ Return ☐

Sampling		Type		Matrix				TOTAL # OF CONTAINERS	Requested Analytical Method #												THIS AREA FOR LAB USE ONLY		
									TO-15 SIM: benzene; carbon tetrachloride; chloroform; 1,2-dichloroethane; *cis*-1,2-dichloroethene; *trans*-1,2-dichloroethene; methylene chloride ; naphthalene; 1,1,2,2-tetrachloroethane; tetrachloroethene;		1,1,2-trichloroethene; trichloroethene; and vinyl chloride									Lab # L1206	Page	of
									Preservative														
Date	Time	COMP	GRAB	WATER	SOIL	AIR	CLIENT SAMPLE ID		UNPRES	~~H_2SO_4~~	~~HNO~~	~~HCl~~	NaOH	ZnAcNaOH							EPA Tier QC Level 1 (Screening) 2 3 4		
																					Canister ID		Lab ID
2/15/12	1510					X	PPϕ3-1A-ϕ1-ϕ21512	1	X	X	X	X									6L24161A		-1
2/15/12	1511					X	PPϕ3-SA-ϕ1-ϕ21512	1	X	X	X	X									6L2557A		-2
2/15/12	1512					X	PPϕ3-SA-ϕ1-ϕ21512-FD	1	X	X	X	X									6L2644A		-3
2/15/12	1520					X	PPϕ3-AA-ϕ1-ϕ21512	1	X	X	X	X									6L2470A		-4
2/16/12	1156					X	PPϕ2-1A-ϕ1-ϕ21612	1	X	X	X	X									6L2712A		-5
2/16/12	1157					X	PPϕ2-1A-ϕ1-ϕ21612-FD	1	X	X	X	X									6L2606S		-6
2/16/12	1158					X	PPϕ2-SA-ϕ1-ϕ21612	1	X	X	X	X									6L2513S		-7
2/16/12	1200					X	PPϕ2-SA-ϕ2-ϕ21612	1	X	X	X	X									6L2501S		-8
2/16/12	1215					X	PPϕ2-AA-ϕ1-ϕ21612	1	X	X	X	X									6L2646A		-9

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Volatile Contaminants/Odorous ☐ Biohazard ☐ Other _____

Relinquished By		Date/Time 2/17/12 1300	Received By: Date/Time
Sampled By and Title	(Please sign and print name)	Date/Time	Relinquished By (Please sign and print name) Date/Time
Received By Janet McGeary	(Please sign and print name) Janet McGeary	Date/Time 2/20/12 0845	Relinquished By (Please sign and print name) Date/Time
Received By	(Please sign and print name)	Date/Time	Shipped Via UPS Fed-Ex Other_____ Tracking #

Special Instructions

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Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: Original – LAB, Yellow – LAB, Pink – Client
Rev 09/2010 LAB FORM 340

CH2MHILL
Applied Sciences Laboratory (ASL)

Sample Receipt Record

Batch Number: L1206

Client/Project: SLOP

Date received: 2/20/12

Checked by: JM

Checked by: _____

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	NA	YES	NO
Radiological Screening for DoD	✓		
Were custody seals intact and on the outside of the cooler?		✓	
Type of packing material: Ice Blue Ice (Bubble wrap)		✓	
Was a Chain of Custody provided?		✓	
Was the Chain of Custody properly filled out? If not document in SRER		✓	
Were the sample containers in good condition (broken or leaking)?		✓	
Containers supplied by ASL?		✓	
Any sample with < 1/2 holding time remaining? If so contact LPM	✓		
Samples have multi-phase? If yes, document on SRER	✓		
Was there ice in the cooler? Enter temp. If >6°C contact client/SRER box °C	✓		
All VOCs free of air bubbles? No, document on SRER	✓		
pH of all samples checked and met requirements? No, then document in SRER	✓		
Enough sample volume provided for analysis? No, document in SRER	✓		
Did sample labels agree with COC? No, document in SRER		✓	
Dissolved/Soluble metals filtered in the field?	✓		
Dissolved/Soluble metals have sediment in bottom of container? Document in SRER	✓		

Sample ID	Reagent	Reagent Lot Number	Volume Added	Initials

CAPA Report
Corrective Action and Preventive Action

Observation

CAPA ID: 21484

CAPA Submitted To	Ginger Collins	**Discipline**	Laboratory Services
Organization	Water	**Procedure**	TO-15 SIM Air analysis-Screening/pressurization contamination--lost sample
Observation Type	Nonconformance to Written Requirement	**Audit ID**	
Submitted By	Kathy Mc Kinley	**Project #**	No Project Number
Location	CVO	**Date Discovered**	3/1/2012
Problem Or Observation	Sample (air) lost/contaminated during pressurization/screening		
Additional Comments	Calibration standard was inadvertently left open while samples were being screened on the same instrument. This caused contamination of one client sample as the concentrator system changed sampling positions.		
Suggested RI	Mike Schaadt, Scott Orsborn		
Suggested Stakeholders	Ben Thompson		
Attachments	AIR12 MAS Update.docx		

Tracking Information

Plan Due By: 3/20/2012

Issue Date	3/2/2012	**Responsible Individual**	Scott Orsborn
CAPA Manager	Ginger Collins	**Non-Conformance Severity**	Minor
Stakeholders	Mike Schaadt, Ben Thompson		
CAPA Manager Comments			

Cause, Prevention, and Planned Actions

Submitted By: Scott Orsborn

Nonconformance Cause	Other, Please Explain
Short-Term Action Plan (Implemented)	An SOP change form will be generated that brings attention to this scenario. All calibration standards will be removed from the sample tree prior to screening of low level samples.
Long-Term Action Plan	(Not Required)

Administrator Verifications & Notes

Short-Term Actions	**(Closed)** Reviewed SOP change form. Submitted for inclusion in SOP.
Long-Term Actions	**(Cancelled)**
Final Comments & Lessons Learned	Remove calibration standards from autosampler after standard analysis and before sample analysis.

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